

The Mining And Metallurgical Journal

VOL. XXI. NO. 12

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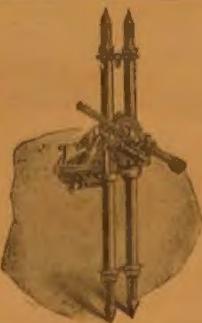
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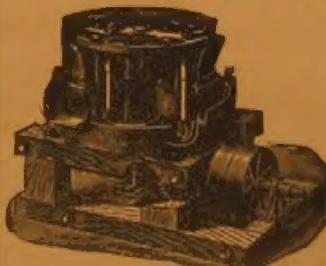
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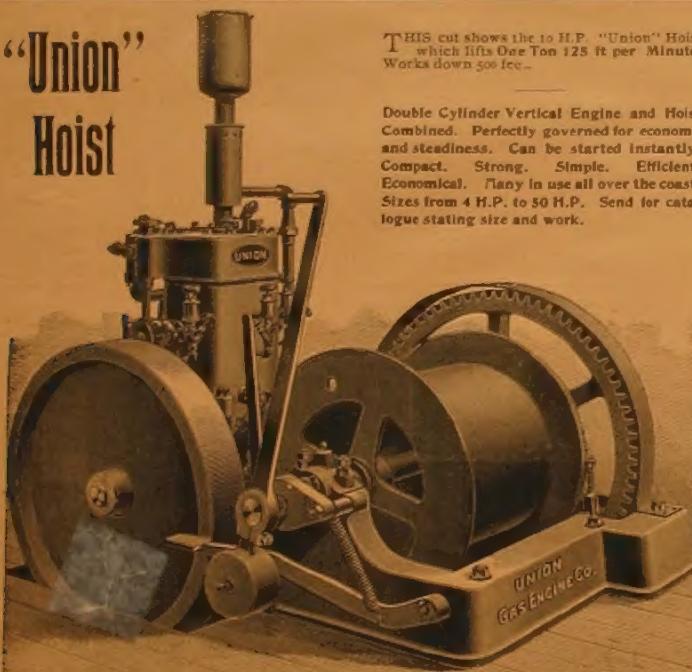
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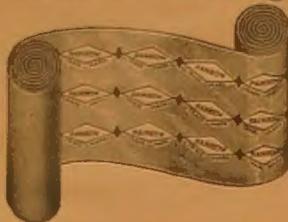
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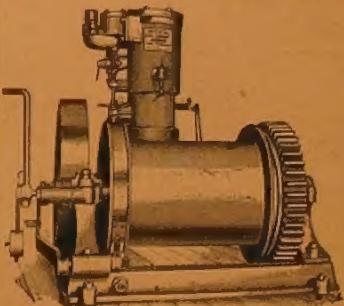
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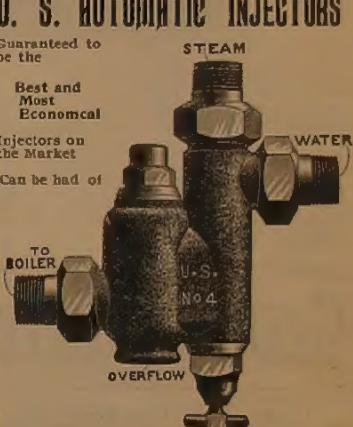
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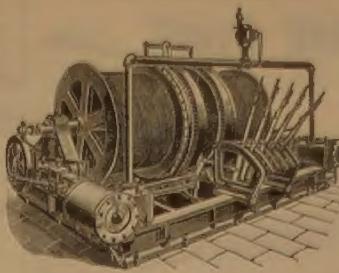


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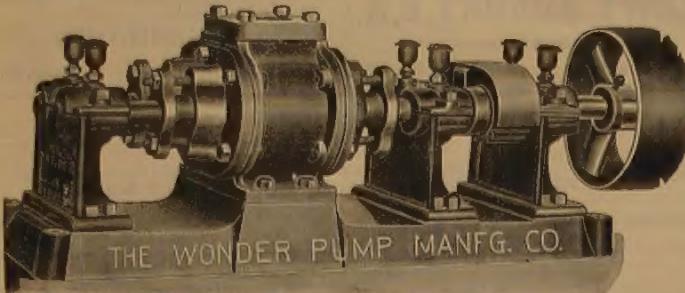
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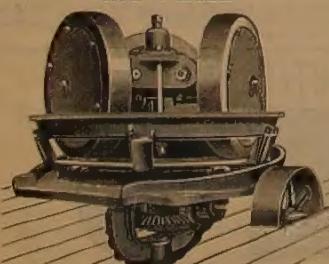
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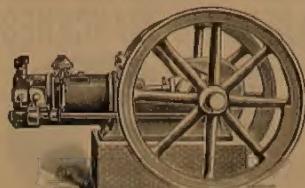
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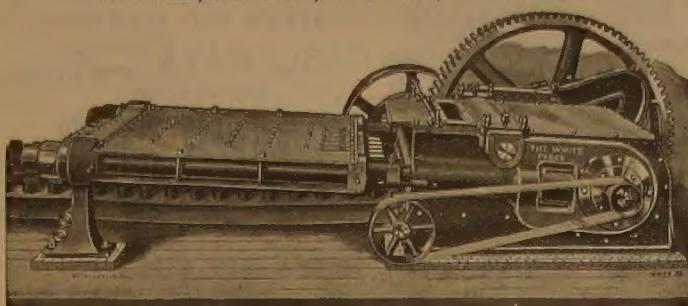
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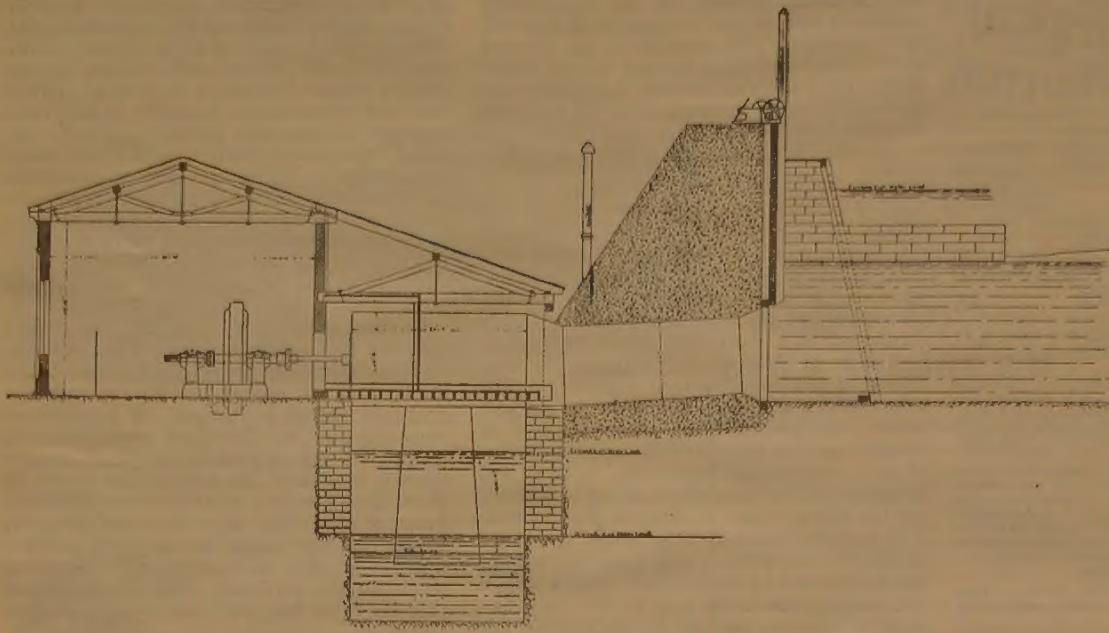


FIG. 6—END VIEW OF POWER HOUSE, TAIL RACE AND DAM.

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[Continued from our issue of September 1st, 1892.]

Two 750-kilowatt units have been in operation in this power house since the last summer, and the third generator, which is a 1500-kilowatt unit, is at present under erection and will be in operation at the earliest possible moment in order to relieve the overload under which the plant is now laboring, as well as to take care of the increase in business awaiting its installation.

Along with this generator, of course, is being erected an equivalent capacity in raising and lowering transformers which explains why these transformers do not appear in the photographs of the plant, although they are shown as erected in the drawings. The comparatively small difference in the relative sizes of 1500 and 750-kilowatt units, even when run under the same speed as is done in the present case, is strikingly shown in the general plan of the power house, from which it is also obvious that two 1500-kilowatt units with accompanying wheels may be substituted for the two 750-kilowatt equipments as installed at any time, if desired, without necessitating changes in the power house. These

generators are of the standard General Electric revolving field type as built by the Canadian General Electrical Company, as is also the entire electrical equipment of the whole installation with the exception of the induction motor operating the War Eagle hoist at Rosland, which was built at the Schenectady works of the General Electric Company. The

generators run at 180 revolutions per minute, have forty poles, and deliver 60-cycle, three phase current at 1100 volts delta.

Underground waterproof ducts carry the generator leads to the switchboard, which, when completed, will consist of three exciter panels, three generator panels, three transformer panels, and four line panels. Nothing of novelty is imparted in the switchboard, as all instruments, appliances and methods are of standard General Electric varieties, with the single exception that the generators are thrown into synchronism on the "out" of the synchronizing lamps, whereas it is the usual practice to synchronize with lamps at full candle power.

In this connection it is interesting to note that at the outset considerable difficulty was experienced in synchronizing the generators, but the trouble was finally located as being due to the fact that the slip-rings on the revolving fields were out of true one-eighth of an inch. Rotation thus introduced a varying resistance in the contact between the brushes and slip-rings which, though imperceptible in the voltmeter and ammeter readings, made synchron-

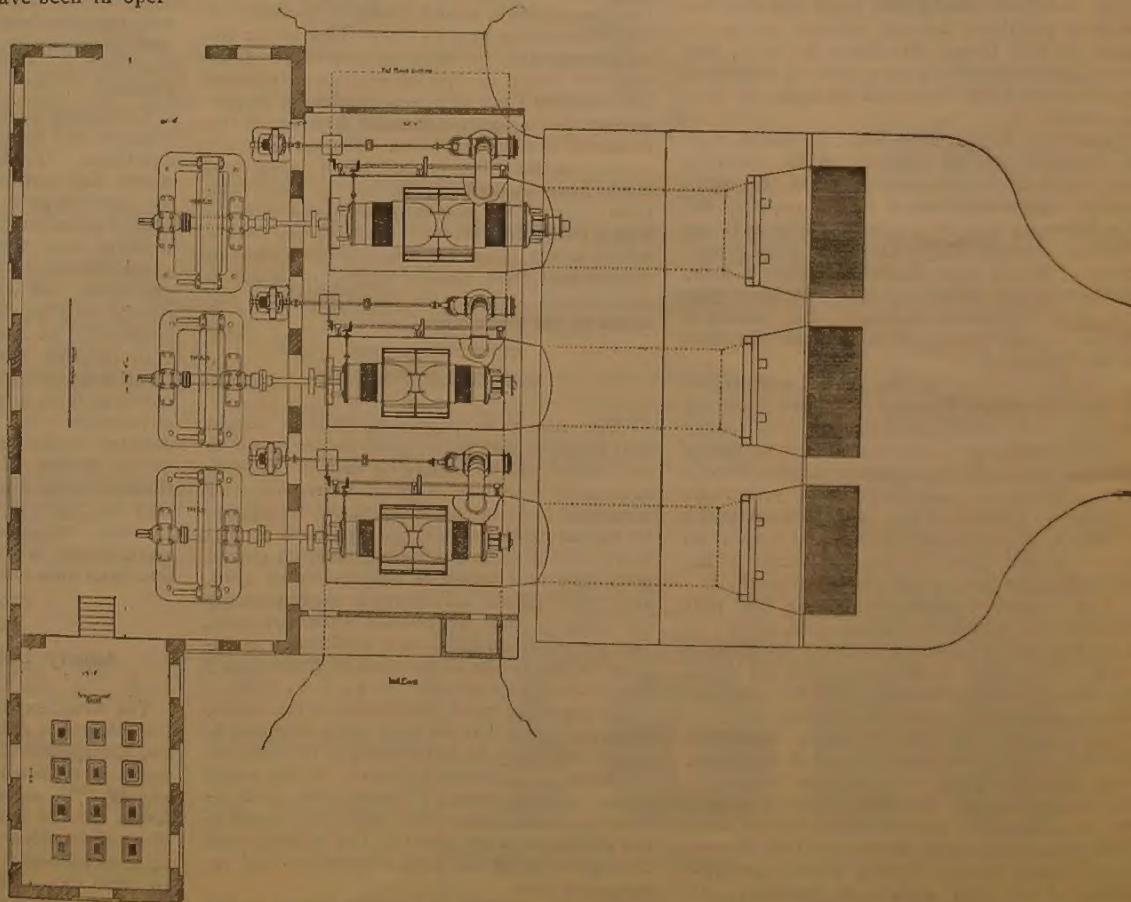


FIG. 7—FLOOR PLAN OF POWER HOUSE.

izing an uncertain performance. However doubtful station engineers may be that the trouble experienced was due to the cause ascribed, it is certain that after the slip-rings were turned down no further difficulty was encountered in synchronizing, which is now

each is driven, are placed under the platform forming the floor of the transformer house, in the space indicated by the slotted grating behind the stairs.* These blowers furnish an air blast to the transformers through large ducts or tunnels after the manner and for the purpose to be described later. The high tension circuits are led from the transformer to porcelain insulators placed on framings overhead in the transformer house and generator room whence they are carried to the line out through eight-inch, vitrified terra cotta piping built in the front wall of the station. Fifteen such pipes exist, thus providing for five three-phase circuits, and the outside orifices of these outlets are roofed.

THE POLE LINE.

The profile of the Kootenay-Rossland transmission astonishes one because of the extreme irregularity of the country it traverses from one end to the other. In fact it resembles the work of the tracing pen on the recording voltmeter chart of a badly regulated incandescent plant, or perhaps even of a railway power service, much more than the profile of a transmission pole line. There is altogether not over a level mile or two in its whole length, and the grades are of all degrees of steepness, reaching the maximum at about 70 per cent. Its length is practically 31 miles, in traversing which its altitude above sea level varies by over 2200 feet.

Aside from the features enumerated, the pole line embodies two characteristics, each of which is, so far as the writer is aware, without precedent in transmission practice. The pole line is double, and on one of these lines both cross-arms are roofed or snow-shedded. The other distinguishing feature consists in the span of 1500 feet that the line wires take in crossing the Columbia River, these wires being unsupported by cable.

Both pole lines are of a very substantial type of construction, being round, specially selected cedar, and varying in length from 30 to 65 feet, according to location. They are set 100 feet apart, or 50 to the mile, with all corners and curves properly guyed. The right of way lies through a heavily wooded country, throughout which a 100-foot clearance has been made from each pole line. The first line built was constructed in the ordinary manner; that is, without roofing, but before it was placed in service the wet snow piled up on the cross-arms to a height of nearly two feet in places, which led to the determination to roof in the second line to prevent any trouble that it was believed would arise from snow. It should be explained that in the Kootenay country there is no wind whatever during snow storms and hardly any wind arises at any time during winter. As the snow is of a very wet nature there is nothing to prevent it piling up to the depth named on cross-arms, or its clinging to the transmission lines until the diameter has been increased to four or even six inches, and oftentimes the accumulation will remain until dissipated by the Chinook winds so characteristic of north-western regions.

The accompanying cuts give the dimensional data of the details and materials used in snow-shedding the second high tension line. As will be seen therefrom, both cross-arms are roofed, the upper one, which carries

four insulators, being covered with a cedar roofing 24 inches wide, while the width of the roof over the lower arm is but one foot four inches. The details of the construction are, however, given so fully in the drawing that a description of them would be redundant.

As a matter of engineering information it may be stated that the following comprises the list of materials for each pole:

Two $\frac{3}{4} \times 14$ -inch machine bolts with 4-inch threads, galvanized.

Four $\frac{3}{4} \times 5$ -inch machine bolts, standard, galvanized.

Two $\frac{5}{8} \times 4$ -inch lag screws, stand., galvanized.

Two $\frac{5}{8} \times 7$ -inch lag screws, standard, galvanized.

Four 7-16-inch wrought washers, standard, galvanized.

Two 9-16-inch wrought washers, standard, galvanized.

Four 3-16-inch cast washers, standard, galvanized.

Four cross-arm braces, $1\frac{1}{4} \times \frac{1}{4} \times 30$ inches; holes, 28 inches, centers.

Six high potential insulators.

Two double Petticoat glass telephone insulators.

Six locust top pins; shank 2 in., diameter 5 inches long, standard top.

Two oak top pins, $1\frac{1}{2}$ inch, standard.

One fir cross-arm, 4×5 inches \times 8 feet, 3 in.

One fir cross-arm, 4×5 inches \times 6 feet, 3 in.

One fir cross-arm, 3×4 inches \times 2 ft. $3\frac{1}{2}$ inches.

Six pieces cedar, 1×8 in. $\times 4$ feet, 6 inches.

Four pieces cedar, 1×8 inches \times 3 feet.

Four pieces fir, $1\frac{1}{4} \times 6$ inches \times 1 ft., 8 in.

Four pieces fir, $1\frac{1}{4} \times 3$ in. \times 1 ft., 10 in.

Four pieces fir, $1\frac{1}{4} \times 3$ in. \times 1 ft., 4 in.

It will be seen by reference to Fig. 10 that the pins used are of specially heavy construction, having a shank $2\frac{1}{2}$ inches in diameter and 5 inches long from the shoulder. The length of the pin over all is $11\frac{1}{2}$ inches, which gives $6\frac{1}{2}$ inches from the top of the cross arms to the top of the pin. These pins are of locust and are boiled in paraffine oil, taken out, cooled and dipped in hot paraffine oil. Porcelain insulators of Redlands type are used throughout. Three wires of a circuit in three-phase transmissions generally form an equilateral triangle, while the wires of the Kootenay transmission form an inverted isosceles triangle with 20 inches on the base and 22 inches on each of the sides.

(To be Continued.)

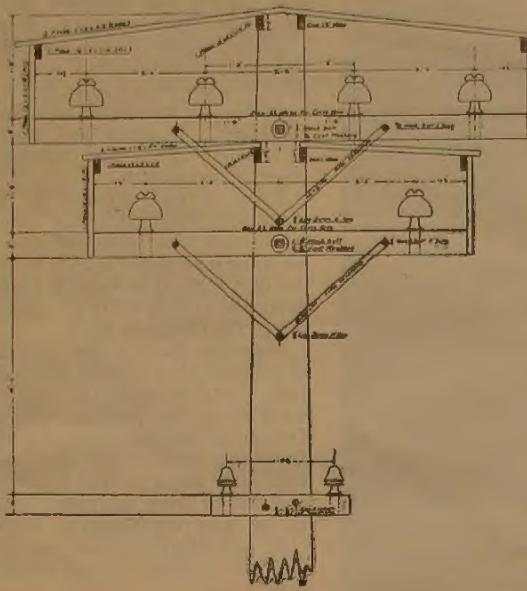


FIG. 8—DETAIL OF POLE AND CROSS-ARM.

done with perfect ease under a variation of 200 amperes.

Ducts placed under the floor carry the leads from the transformer panels to the raising transformers. There are twelve of these, each having a capacity of 250 kilowatts and wound for 1100 volts on the primary with either 11,620 volts or 20,100 volts on the secondary, according to whether delta or Y. The higher potential of 20,100 volts is delivered to the line.

It is the opinion of the writer that if it had been the general custom to install air-blast transformers in the manner adopted by the West Kootenay Power and Light Company and to have maintained them under the same care and attendance as the Kootenay company is administering to the air-blast transformers in its installation, a greater degree of success would have attended their use than has been the experience of a few of the many transmissions which have adopted them. More detailed reference to this matter will however, be given in describing the step down transformer installation at the Rossland sub-station, as the ideas to be conveyed may be then more clearly set forth by reference to the structural drawings presented, and the principles involved apply equally well to the transformer house at the generating station.

In this transformer house three 60-inch Buffalo blowers together with the two horse-power, 110-volt induction motors from which

FIG. 9 — A SIDE VIEW OF POLE AND CROSS-ARM.

*See Figure 4 in our issue of Sept. 1st, 1899.

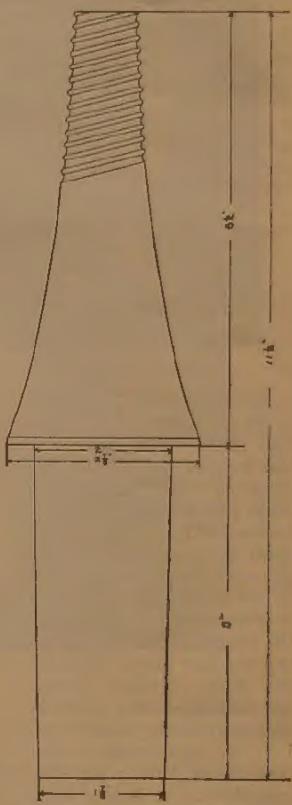


FIG. 10—DETAILS OF PIN.

ARIZONA'S BIGGEST GOLD MINE.*

BY SHARLOT M. HALL.



THE CONGRESS CYANIDE PLANT

Almost midway, as the miles go, between Prescott and Phoenix, but a little to the west of the Santa Fe, Prescott and Phoenix railway, just where the Hassayampa mountains tumble their tons of sun-bleached granite abruptly into the skirts of the desert and the tourist going south finds the first giant cactus elbowing the last pinon, is one of the most "typical" things in Arizona—only a little bigger than the rest.

It is unfortunate that just about this point the casual traveler is too busy reconstructing his notions of Southwestern geography and straining his eyes for the first glimpse of a desert that does not materialize, to guess that the twinkling lights up the mountain side beyond Congress Junction mark something better worth seeing than miles of verified atlas.

The axis of the earth may not stick out visibly in this region but the ribs of the continent do; and some restless prospector delving among the disjointed vertebræ struck one of those "pay streaks" with which nature sometimes chinks her unpromising handiwork.

The landscape immediately about Congress inclines to the perpendicular, with no suggestion of effort wasted in fertility. If Josh

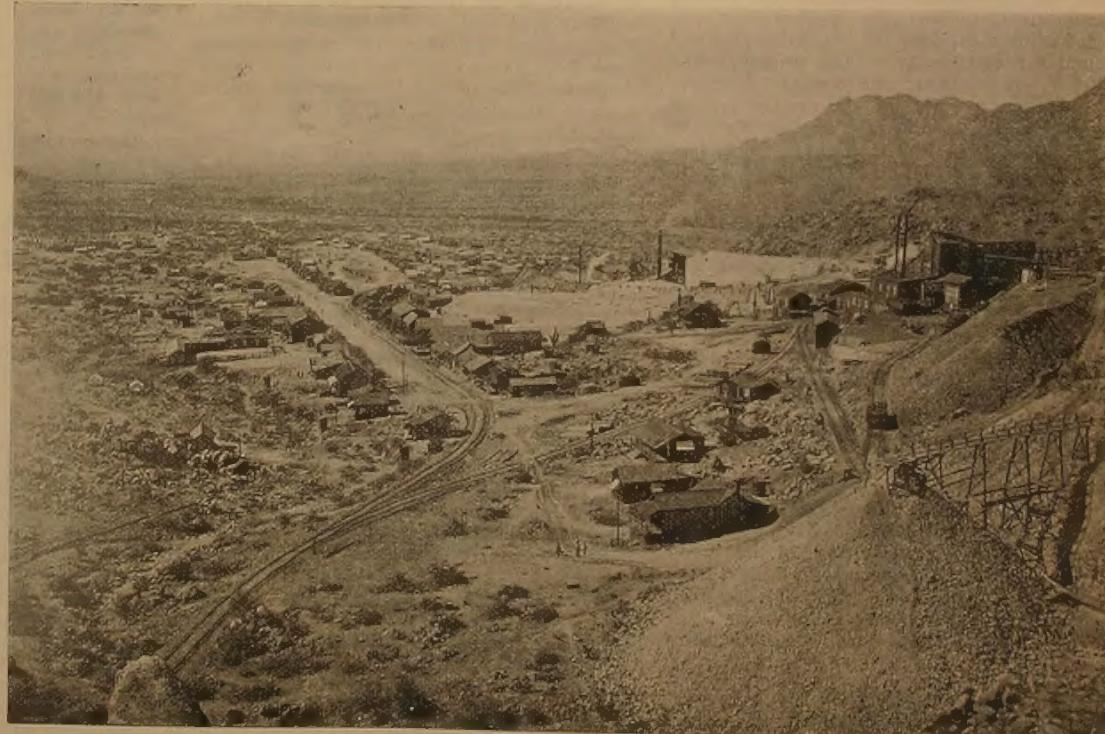
*From "The Land of Sunshine" of Los Angeles, Cal.

and the mill buildings rest on made foundations or straddle over ditches and boulders like Landes peasants on stilts. But a mining camp would not be "typical" if nature had pre-ordained its site for a human dwelling place—or its inhabitants for neighbors. Congress had more to recommend it than convenience; it had wealth.

Forming one segment of a circle which has given the mining history of Arizona its farthest-known names, it is little wonder that scarcity of water did not deter nor greatly delay prospecting in the Congress hills.

From the dump at the mouth of the main shaft a triple notched peak thirty miles to the southward marks the Vulture, once a Dorado of fabulous richness; as far to the west is the Bullard, held for a half a million in gold, and like to bring its price, and to the east are Stanton, Rich Hill, and Weaver of evil reputation but the heart of a rich placer belt.

Though prospectors came and went through this section in the days of the Argonauts, it is only about twelve years since the original owner of Congress came



CONGRESS, ARIZONA.

Billings could have cast his eye over the rocky hillside, spattered with the quartzy line of Congress ledge, he would have amended his famous remark about piety and beans, and added that gold also seems to flourish best in the poorest soil. The very cacti look dizzy with clinging to their uncertain perches,

down the little canyon "at the wake end of a burro," and selecting a favorable location on the big ledge which may be traced a mile or two across the hills, presently uncovered "pyramids as big as me fist, sure" and rich enough to warrant a prolonged celebration.

Whether through this cheerful tendency,

or in deference to a proverb current among old prospectors, that the man who strikes a big lode never makes a stake out of it, the discoverer of Arizona's richest gold mine drifts about the camp in time-worn jumpers and overalls.

The property changed hands a good many times in the early years following its discovery before coming to its present owners, the Congress Gold Company, an association of experienced mining men who have it a standard for progressive and successful operations. There is not to-day a better ordered camp in the Southwest nor one in which employers and employed work in greater harmony.

An old man sweeping the already clean floor of the shafthouse leaned on his broom and said with a leisurely smile of proprietorship: "Twenty years I've worked for Mr. Gage; Tombstone first, then right here at Congress ever since the company came. That boy over yonder hasn't lost a shift in four years; lots of the men have worked two and three years without a lay-off. Nobody quits here except to die or to go to work for himself—and we're mostly too busy to die"—a statement borne out by the meagerly filled graveyard across the

concentrates and fifteen tons of shipping ore, with the largest cyanide plant in the United States working away on the tailings to run the monthly tally up by many thousands.

The reduction works at Congress consist of a forty-stamp mill and the above mentioned cyanide plant. The mill has some of the

to sort itself, much as oranges and potatoes are sorted for market, the oversize going to two huge Blake crushers where it is chewed, literally, in the awsome iron jaws to the required size. Slipping on into storage bins it is fed out through Tullock feeders to the forty 850-pound stamps that out distance the seconds, and drop six inches ninety times a minute. The mill-house rocks and roars like a ship in a stormy sea, or a city in the gripe of an earthquake, as the great stamps rise and fall. In sets of five, with rhythmic movement of clock-work, they beat up and down, strong pulses from the mighty heart of gain.

The rock-pulp, wet now, flows from the stamps to the vanners, twenty ever-shaking, endless belts, like broad dining tables; it is "concentrates" at last and with a brief interval of draining on the sand filter is ready to go, all moist and unsacked, into the cars for shipment to the smelter at El Paso. It is done with, so far as the mill is concerned; but partly because the water supply is short; for every quart of water used in mill and camp comes from Martinez Creek, a mile away, and is raised 500 feet to get it over the intervening mountain. There is some gold left in the car-loads of tail-



SOME OF THE CONGRESS ROCKS



SLUM-POOL AT CYANIDE PLANT



TAKING OUT ORE.

canyon back of the town. Though, perhaps, its tenants condition is due in part to the scarcity of saloons that usually form such a liberal portion of a mining camp, for here those vultures must perch set themselves apart with their black kin of the desert, beyond the limits of Company ground.

The atmosphere of the camp (and incidentally its difference from some other mining camps) is indicated by that one remark, "Nobody quits." Many of the miners have built neat little houses and have their families with them; and though there are not probably two dozen men of any one nationality among the 350 or more employed in mill and mine, it is "home" to all alike. A school-house that would do credit to a prosperous village overflows with sun-browned children, and the camp even boasts of a tennis court tipped up against a grand slope overlooking the town. All this busy life centers around some big red-roofed buildings high upon the hill, and some cool, dark openings in the mountain side whence come the "sinews of war"—a car a day of



TAILING-DUMP AND LOCOMOTIVE.

finest machinery in the West and eats up one hundred tons of ore a day as easily as a hungry man eats dinner. Coming up four cars at a time from the stopes and workings, hundreds of feet below, the ore is dumped on "grizzlies"

ings that are rolled out on long trestles and dumped in putty-colored mountains below the mill.

A great mine is not unlike a well managed household; there are no wastes permitted, small or great; so in the spring of 1895 a cyanide plant with a capacity of 100 tons a day was put in to work on these gold-bearing tailings.

The ninety-ton leaching tanks, pumps, pipe lines, zinc boxes and mechanical roaster form another plant, approaching the stamp mill in size and even more interesting.

"Cyaniding" as it is briefly called, is a comparatively new treatment, and its principles are but dimly understood except by persons actively engaged in the work.

That gold is as soluble in certain solutions as a lump of sugar in water is a surprising statement to the average mortal, yet it is quite true, and is the basis of all gold-plating processes used by manufacturing jewelers as well as of the cyanide treatment for ores and tailings.

At Congress the process is adapted to local circumstances; the tailing dumps are plowed

to assist in drying them, and the dry product carried by wheel scrapers to a pulverizer, from which it is discharged by an elevator to the storage bins and thence to the self-feeder of the furnace.

In the long furnace, capable of roasting one hundred tons a day, each "roast" stays four hours, passing to a cooler and at last, as needed, to the leaching tanks. Here, in a solution of cyanide of potassium, the gold is dissolved and drawn off by filtration, leaving the sand and waste behind. The filtered solution next enters an intricate arrangement of boxes filled with shavings of pure zinc, where the gold is precipitated, and the water, carrying some zinc and the remaining cyanide, goes on to storage tanks, from which it is used over and over again. For water is next in value to gold at Congress, and never a drop is wasted.

The cyanide treatment changes the tailings from a dirty white color to red, and the busy plant is hemming itself in with great mountains of impalpable red dust, that wheels in blinding clouds before the desert wind. Contrasting sharply with the red waste of the cyanide plant looms up the tons of dump from the mill, enough tailings, it is said, to keep the lower plant running night and day for five years if the mill were to shut down tomorrow and not crush another pound of ore in that time.

The mine itself is made up of twenty three claims, following the snake-like trail of the croppings across the hills. There are three big openings in the mountain-side along the Congress vein, and two smaller but very important ones on the parallel Niagara ledge. The main shaft, No. 2, is nearing the 2500-foot level, and still the beautiful white quartz, rich with sparkling iron pyrites, goes on to unguessed depths. Another shaft, 650 feet, and another something less, are connected with No. 2 by levels at intervals of three hundred feet, the levels serving to perfect the air circulation and to facilitate working. There is free passage through the thousand foot tunnels from shaft to shaft all over the mine, and it is said that ten miles would scarcely cover the horizontal workings.

Congress is not a wet mine nor a warm one; no water has been found so far (except a small seep in the shaft near the 1800-foot level), hardly enough to wet one's shoes; and possibly because the shaft follows the dip of the ledge, having an incline of only about thirty degrees, the deeper levels are cool and pleasant. A forest of Oregon pine has been stowed away in timbering this gold-lined under-world, and the waste trap-rock and tailings taken out have filled up canyons and built new mountains rivaling the old. Half of the waste never sees daylight, but is used to fill up worked out stopes and drifts, so the immense dumps are a very modest index to the underground workings.

Mine, mills, and all company buildings are lighted by electricity, and the company owns and operates its own railroad connecting the mine with the main line between Prescott and Phoenix. A wonderful road it is, with sharper curves and heavier grades and more of them to its four miles than are to be found on any other standard gauge road in the United States (a thirty degree curve is coming close to railroading around a corner, and five per cent grades are not seen every day), getting up the mountain at last by a series of switchbacks to the very mouth of the mine, and discharging its freight on the edge of a sky-sweeping view.

To be "typical" a mining camp must have

two distinct sections, "Mill Town" and "Lower Town." Mill Town at Congress, with its store, offices, bunk-house, and homes of the employees, toes the line along the railroad track with conscious virtue: it is a place where good people eat and sleep between times of working, and, considering the lack of water, it has a right to be proud of itself. Lower Town, straggling along the canyon half a mile below, is like all of its kind—only more so; a few less pretentious frame buildings, a few more roofless adobes and canvas lean-los, with acres of battered tin cans and ragged gunny sacks between.

Two fires in ten months have nipped its enthusiasm, and besides in a climate where clothing is a concession to prejudice, houses are superfluous.

Its citizens would be as typical in Klondike or Kimberly; they have foregathered from all ends of the earth, and no man knows his neighbor's mother tongue, or the gods he was born to. Gold is the business of life and miners into ancient history are not encouraged.

There are no holidays at Congress; down in the mine the cables whiz and picks tap day and night, week in and week out, the year through. Nothing stops, except when once a month the forty rumbling stamps stand still for a few hours, and a "clean up" is made. Then all ears ache with the silence till the thud and roar begin again.

The mountain sides all along are dotted with fresh dumps and burrowing prospect holes—for every miner in camp is ambitious to "strike another Congress," another lead that will turn out 3,600 ounces of gold a month, and keep it up as regular as the march of the seasons.

The South African Chemical and Metallurgical Society states that ground glass is a most excellent flux for cyanide slimes. The charge for melting is 50 lbs. white glass and 50 lbs borax to each 100 lbs. of roasted slimes treated.

CORRESPONDENCE

CALIFORNIA.

VIRGINIA DALE MINING DISTRICT,
SAN BERNARDINO CO., Aug. 23, 1899.

The little town of Dale has been very dull this summer on account of so many people being away to the coast during the hot weather, but is getting better now as the people have already begun to return to the camp.

Ames & Yager of the Brooklyn mine have returned and will soon have their mine and mill in operation again.

The Ivaehoe mine did not shut down at all this year, and the mill kept driving its stamps on thirty-dollar ore.

The Star King mine is now looking very fine. The ledge is over two feet thick and milling over forty dollars a ton on Mr. Machem's mill.

The O. K. mine is looking better every day. The ore in the drift at the two hundred and fifty-foot level is over three feet wide and is about the best ore in the mine. Superintendent Goff says it is surprising how the ore increases in value as the mine goes down.

Hardie & Wellington are down fifty feet on the M. S., their south extension of the O. K. mine, and are drifting west to find the ledge.

Isaac B. Reed is drifting north on the 100-foot level of the Sweden No. 2, and has

about two feet of high-grade ore, some pockets in it being simply strung together with wire gold.

George E. Kirkpatrick has bought the Single Standard claim in Gold Basin, and has just sunk a 12 foot hole on the east ledge, which shows about two feet of real good ore.

The placer mines are not doing much now, on account of the summer rains having made the ground too wet to work well in the dry washers.

DALK MINER.

OREGON.

BOHemia, DOUGLAS COUNTY, ORE.

Bohemia is a flourishing little camp, on the line of Lane and Douglas counties, between Eugene in Lane County, and Roseburg in Douglas county. A good deal of money has been expended in opening the mines.

The staid people of the valley scarcely have a glimmering idea of the amount of money required to open and operate mines and mining mills. As an indication of the actual cash expended in Bohemia thus far, it may be stated that there is approximately 13,500 feet of tunnels driven in various ledges throughout the camp. The Noonday and Musick lead, with about 4,500 and 4,000 respectively, while the Champion, Helena, Vesuvius and others have a good showing. The average cost of the tunnel is estimated at \$8 per foot, showing \$108,000 expended for this work alone.

The mills of the district have sixty stamps apportioned as follows: Noonday, 20; Musick, 15; Champion, 10; Helena, 10; Stocks & Harlow, 5. Placed in position at the various mill sites, the value of their plants will exceed \$50,000, or showing a total of nearly \$160,000 for the two items of tunnels and mills.

As a basis on which to consider the financial investment it is stated that the Musick mine, under the management of J. W. Cook, its former superintendent, yielded \$90,000; the old Knott mine, \$40,000, and the Champion mine, \$35,000, a total of \$165,000, showing that even in the infancy of the district it has proven a case of "money back." But in addition to this the Helena, Vesuvius and other properties have yielded more than handsome returns on the money expended upon them.

The Musick mine is operating its 15-stamp mill, running 24 hours a day and grinding 25 tons of ore in that time. Stocks & Harlow's 5-stamp mill is running on Vesuvius ore. The Noonday company will start 10 stamps within a week, and probably more, and it is not impossible that the Champion mill will soon be again in active operation. At least 200 people are now on company pay rolls. This of itself shows not less than \$3,000 per week paid for labor in the district—an indication not to be disregarded.

H. W. R.

UTAH.

SALT LAKE CITY, Sept. 2, 1899.

EDITOR JOURNAL: The mining stock market showed some strength at the first of the week, but gradually fell off towards the end.

Ajax quiet and stationery. Bullion-Beck doing well at the mines, but the stock quiet. Chloride Point strong on inside buying.

Daily active but lower. Daily West higher on expectation of dividend in October. Dexter higher. After recovering to 29½ cents

on Wednesday Daisy lost again on Thursday, selling down to 25 cents, at which figure good support was given it. Some delay is experienced in obtaining timber for new mill.

Eagle and Blue Bell weaker. Four Aces stronger. Reports from the property are encouraging.

Geyser Marion is doing well at the properties, but the stock after selling above 50 cents broke badly at the close. Galena was active and higher. Grand Central higher.

Joe Bowers active at stationery prices. Joe Bowers Extension lower. La Reine is improving; the up raise is now twenty feet wide with high grade ore the entire width. The winze has nice body of lead ore, and is getting better every foot. Price dropped a little through manipulation of a few brokers; does not affect merit of mine. Lower Mammoth lower.

Mammoth was one of the heaviest dealers of the week. Effort is being made to maintain present dividends. Mercur stronger. May Day active and higher. Northern Light lower.

Petro lower after payment of dividend, although all reports from mines are favorable. Sunshine is showing up well at the mines. Swansea scarce and in demand. South Swansea has declared its usual dividend. Sacramento paid its regular dividend, and everything is favorable as usual at the mines. Star Consolidated is reported as doing well at the mines.

Utah is widening its shaft, and a shipment of good ore came from mines. Valeo sent in \$4,000 worth of ore during the week.

Very respectfully, P. J. CONWAY.

Miscellaneous Mining News.

ARIZONA.

Chloride Notes.

The Juno mine is fast coming to the front. The ore is ruby and glance, and there is a small fortune in each carload.

The Tennessee concentrator is running night and day and turning out 30 tons daily. They ship by the railroad.

The Elkhart is working a large force of men and they have nearly enough water to operate their big concentrator night and day.

Brown & Coolidge have struck the ore chute in the Altata and are taking out fine ore in quantity. The Altata has produced a large amount of ore in the past and if the ore chute had always been followed there never would have been a stoppage of ore extraction.

Since the rich strike of copper glance in the Sterling, near Jerome, the Mark Smith, which is the first north extension, has been the subject of considerable comment, principally on account of the lay of the ground, many miners claiming that the largest ore bodies will be found on the Mark Smith.

Manager Taft of the Sterling, with his usual wise forethought, advised his corporation to buy Mr. Brooks' property, but during the negotiations the Cliffords slipped in and the desirable property passes to the Pride of Arizona Copper Company, who had a day and night shift upon the Mark Smith a few hours after the deal was closed.

The Sterling vein is one of the most remarkable copper propositions yet uncovered south of the United Verde. The ore is

richer than the Lone Pine, Geo. Ropeter's mine, which is the county's largest shipper. Manager Taft is selling the Sterling ore to the Clifford smelter at Big Bug, and its average is over 35 per cent copper. The Brooks' property consists of four claims and all in good ore.

CALIFORNIA.

AMADOR COUNTY.

Bunker Hill Consolidated Gold Mining Company.

The purchasers of the Bunker Hill and Mayflower gold mines near Amador city have incorporated with 200,000 shares of stock. The president of the company is W. F. Detert; superintendent, C. K. Downs; they, together with R. F. Taylor, E. C. Voorheis and W. J. McGee, constitute the directors of the company. One-half of the stock is retained by the owners of the mine before it was bought by the recently-organized company, and the balance will be sold for development purposes. Work will be commenced at once.

At the Oneida Mine Superintendent Truscott has run drifts both north and south from the 1900-foot level. Both drifts are in a vein of about six feet in width. The work of undermining the old shaft has been commenced. A mill on this property is a certainty, and, although arrangements for a mill have not as yet been made, it is safe to predict that it will be erected not later than the spring of 1900.—*Amador Ledger.*

CALAVERAS COUNTY.

The Lucky Boy quartz mine, located about four miles from San Andreas, on the Copperopolis, has been sold or bonded by the owner, James Waters, to a Boston syndicate for \$10,000. \$1000 was paid down by the bonders, and agreements were signed calling for the payment of \$1000 every six months until the total sum of \$10,000 shall have been paid. It is the intention of the new owners of the Lucky Boy to put a steam hoist on the mine and to sink at least 500 feet on the ledge. Work is to begin within thirty days, after which a systematic development of the property is to be made.

The work of unwatering the Sheep Ranch mine was begun by the use of two water tanks, and small ones at that. The large ones cannot be used yet because the shaft is not large enough to take them, but it is to be enlarged as soon as possible, and the large tanks are then to be put on. Superintendent Garbarini says the rig he is now using is lifting 600,000 gallons of water every twenty-four hours by the use of but one boiler of the battery of four, and burning but one and one-half cords of wood in that time.

EL DORADO COUNTY

The Gopher-Boulder and Dalmatia mines at Kelsey have been sold, including the mills and water power. The sale was made through D. H. Jackson and was consummated in San Francisco. W. C. Bell was the owner of these mines and he received between \$100,000 and \$150,000 cash for them. The new owners are J. C. Alvarado and a company from London. D. H. Jackson will be superintendent and will have seventy men constantly employed.

INYO COUNTY.

Superintendent Harrison of the Radcliff Mining and Milling Co. of Ballarat made a flying trip to Johannesburg last week, a broken cable on the tramway being the cause. Mr. Harrison telegraphed to Los Angeles for a new one, which has arrived at its destination, so the shut-down was of short duration. It is a plow steel cable and weighs 2,760 pounds. It went by the Wells, Fargo Express Co.

KERN COUNTY.

"Topy" Johnson, who has a good copper property at Pilot Knob, and plenty of water, is about to put in a mill for concentrating, something after the style of the jiggers used at the Michigan mines in the Lake Superior region.

A Mr. Gordon is putting a two-stamp mill up near the California Borax Factory, on the Borax lake, to work his own mine.

Dean & Jones of the same place have thrown away their gasoline power and are making a test of the Garlock coal and expect to use 1000 tons during the year. They have added ten more stamps, making twenty in all.

Chas. A. Koehn has re-opened his store at Kane Springs, and is working the old cyanide plant.

W. H. Green and others are vigorously endeavoring to establish a smelter at Hogan's Wells, near the great and rich Radamacher mine. The ore in the neighborhood is very plentiful and rich in gold and other mineral, but absolutely refuses to deliver up its treasure except to fire.

Geo. Brady has moved his blacksmith shop to Randsburg from Garlock and has turned the hotel over to J. E. Vedder, of the Soldiers' Home.

A large cyanide plant passed over the Borax road last week, destined for some person or company in the State Range near Ballarat.

The Norvil mine, Slate Range, is about to change hands, having been purchased, it is said, by a rich Los Angeles company, who will make great improvements.

Yellow Aster Notes.

They will patent several of their smaller properties in a short time.

Things are running along smoothly and the development work is still being pushed forward.

Sept. 1st was a general clean up day, and the mill took a deserved rest; even the tailing ponds were given a good flushing.

The Yellow Aster mill is now crushing 150 tons of ore, which is an increase of ten tons. The ore is somewhat richer than usual.

It is reported that the Joyful mine will begin operations about Sept. 1st. This is one of the properties under the management of Mr. Stebbins of Ballarat.

The main shaft in the Standford group is 100 feet deep and they are now sinking a winze from that level. The ore in the last milling averaged \$30 per ton.

The Wedge mine is now taking out ore from the 200, 350 and 450-foot levels, and the average mill run of this mine is \$75 per ton. The main shaft is down some 500 feet. From a clean-up of a milling of 47 tons they got \$3,300 a few days ago at the Red Dog mill.—*Randsburg Miner.*

MARIPOSA COUNTY.

The Narrow Gauge Company is taking some rich ore from the Hornitos mine. The gold in the quartz is plainly visible without

a glass. Many large pockets were taken from this mine in the early '50's; but this is the first time it has ever been worked a hundred feet below the surface.

J. H. McKenzie has been elected to the position of manager of the Mariposa Commercial and Mining Company, in place of Captain Mein, who resigned.

SIERRA COUNTY.

Some time ago a strike was made in the Harper quartz mine at Forest City, near Grass Valley. The property opened by J. S. Harper. He represents such capital as the Sharons, Spreckels and many other millionaires. It is said that a bowlful of quartz was brought in from the mine which was about two-thirds gold. Such finds have been numerous of late, and the indications are that thousands of dollars will be extracted in a comparatively short time. The mining outlook in that part of Sierra county is better than for years past.

SAN DIEGO COUNTY.

C. W. Pauly, receiver for the Golden Cross mines, has applied to the Superior Court for permission to erect a cyanide plant, for the purpose of working over the tailings, the value of which is estimated at \$900,000. Hearing on the application has been set for September 4. The mines are in good condition, and, according to report, will continue as good producers for many years. There remains \$12,000 due as salary. This Mr. Pauly desires before he releases his position.

Mining men are interested in the discovery of rich ledges of gold ore a few miles northeast of Campo, at the south end of the Laguna Mountains, by Messrs. Alexander and Buskirk. Mr. Alexander is a miner of considerable ability, who knows good ore when he sees it. The claims found by him and his partner are in a new section, so far as gold mines are concerned, but as the free-milling rock they mine runs \$34 in assays, it will not be long before all the surrounding country is prospected. Free-milling ore of that value is good enough for the average prospector. The claims are in a section where both wood and water are to be found in sufficient quantities to warrant the thorough development of promising mines.

TUOLUMNE COUNTY.

Wing-Damming in Tuolumne.

Whittaker & Ray, with S. H. Redden of Fresno, are at work wing-damming on the river near Don Pedro's and are working about fifteen men. They have got a big water wheel to run three 3x10 pumps and will set them in motion next week. These men have got hold of a good piece of river and, if nothing happens, will take out a good piece of money. They recently had some rope and supplies stolen from where it had been unloaded from a train at old Don Pedro station, but hope to recover it.

COLORADO.

The oldest shaft on the Tucker lode in Quartz Valley district, Gilpin county, is being cleaned out by E. B. Curtis. This shaft has not been worked since the early '60's and is supposed to be down about 200 feet, and it has been cleaned out now to a depth of 140

feet. A first-class timbered shaft has been put down all the way as far as has been gone. Some fair-looking pieces of ore have been taken out, and Mr. Curtis started a force of miners to breaking ground this week for the purpose of getting out a trial shipment of the ore.

A new strike of considerable magnitude has recently been made by the Saw Pit Gold Mining and Milling Company in the Coxey group of claims, Mt. Wilson district. During the past winter this company expended a goodly sum of money in development upon these properties, believing that they had, ahead of the drift they were running, veins which when opened up would pay back to the stockholders a good return in dollars for every cent they were expending. That their surmises were correct has been proven, and the Coxey group has within the past few weeks advanced from the list of prospects to a substantial producer.

The Special Session is devoting the entire year to its development. Over 1,000 feet of ground is opened up, in 400 feet of which a fourteen-inch vein is exposed, which exceeds \$50 per ton assay value. In times past this property has shipped some very high-grade ore. Next year a large mill and concentrating plant will be built to take care of the output. There is now 200 tons of ore on the dump. E. L. Davis of Telluride, a well-known mining man, is owner of the property.

IDAHO.

Great alterations have been completed at the giant Standard concentrator. A new flume has been constructed. The water wheel was taken from the bottom of the mill to the top, where the high flume from Canyon creek still furnishes plenty of head, leaving the washing to be done with water after passing the wheel instead of taking it from above, as of old. The crusher was moved from its old place up just below the new ore bins, and a host of minor changes were made to coincide with these alterations.

A big Sunset mining deal has just been completed whereby Montreal parties secure the Father Lode mine for \$50,000.

The shaft on the Hunter is now down nearly 100 feet and has been in ore nearly all the way. The air compressor has been used for several weeks, and the mill will be rebuilt in time to begin work by the first of the year. It is the intention to put up a concentrator that will handle 200 tons daily.

The long crosscut tunnel at the Colwyn cut the vein west of the ore chute, and five men are now drifting to reach it. It is hardly hoped for short of 100 feet, and it may be 200 if the chute dips to the east as it goes down.

Since the contract was recently let on the Chloride Queen property the tunnel has been continued about fifteen feet, most of the way through very hard quartz carrying some galena.—*Wallace Press*.

MICHIGAN.

Lake Freights.

The lake freight situation is similar to that in some lines of iron and steel products—very firm and advancing rates, but comparatively few actual transactions because tonnage cannot be had. So few boats are available for ore

that the current rates on wild charter stand for that fact rather than for a great pressure of uncovered ore, as might be judged ordinarily from such steady advances. From \$1.15 one week ago the rate from the head of the lake has gone to \$1.40, business having been done at that figure, and vesselmen already talk confidently of a \$2 rate later in the season. Marquette business has been done at \$1.15 and Escanaba charters for Ohio ports are still made at \$1, though \$1.10 is talked of by owners.

At the Michigan copper mine near Ontonagon everything is going along smoothly. "A" shaft is down 345 feet, and "B" shaft has reached a depth of 375 feet. The new "C" shaft, which is located 1,200 feet east of "B," is being shaped, and Mr. W. H. Williams, who has charge of the work there, showed some very nice copper already encountered. This shaft will be 7x18 feet, double compartment and at a depth of 210 feet will intersect the drift now being driven on the course of the vein from the Rockland adit, and which is in already 30 feet. The adit from which the drift leads is 500 feet long, and the drift branches from it at 300 feet from its mouth. If the mines in the drift reach the point where they are to intersect "C" shaft, first they will rise from the bottom to meet the men in the shaft. At present only a small force can be worked to advantage in the drift. This drift, like all others in the "Calico" load, is rich in copper as any one can see by a walk in there.

MINNESOTA.

Work is going on faster than ever at the blast furnace in West Duluth, and the people of that section think they have something in site that means the employment of men at good wages. The furnace is still far from a condition that would make it seem that it would be ready for use very soon however.

The big dock of the company is the place where a lot of work is doing at the present time in order to get everything in readiness for the reception of coke and ore. From the dock to the top of the furnace a big railway has been rebuilt and repaired so that the cars containing the ore and coke can be run right up to the top of the big oven and dumped into the furnace. The ore then comes out at the bottom of the furnace and is cast into pigs.

The furnace is still far from finished and ready for use. It is much more than half way up, but there are many things to be added yet. The men are now working in it with brick and building it up. Cement is used in the laying of brick instead of the common sand that is put into most brick buildings.

The structural part of the gas house that will be used to furnish gas to the furnace is well along. The cellar is of brick and the superstructure of iron.

Taking into consideration the amount of work that remains to be done on the plant, it will be about thirty days before it will be ready for operation. A big force of men is at work, however, and it is thought it will be ready by that time.

A large iron property deal has just been closed in Duluth. The deal consists of the sale of 80 acres near Hibbing, St. Louis county, and the lease of nine 40-acre pieces. The persons making the lease are M. H. Alworth of Duluth; M. D. Hull of Chicago and his sister, Mrs. Gaylord of the same city;

Mrs. Owsley of Albemarle county, Va., formerly the widow of Wilhelm Bowing, and two minors of the Bowing estate. The Lake Superior Consolidated Iron Mines is making the lease. It will run for 40 years, except as to the interest of the minors, under the new law, can run no longer than 25 years. The minimum amount to be mined is 300,000 tons each year, and the royalty is to be 25 cents per ton. The property to be leased includes the Sellers mine, the Hull mine and the Hibbing townsite mine. The last named is in the town of Hibbing and was originally platted into town lots. Before the property was occupied ore was discovered and the owners withdrew it from the market. The consideration in the deal is not made public.—*Duluth Tribune*.

MISSOURI.

Joplin Ore Market.

There was no change in the price of top grade zinc ore, which sold for \$45 per ton for strictly fancy grades, but lower grades advanced from \$1 to \$2 per ton, and there was a heavy demand all the week. Everything in sight was bought up and a good deal of ore was sold for delivery this week. Lead declined 50c. per 1,000, selling at \$27. As compared with the preceding week, the zinc sales were less by 596,760 lbs., but the lead sales were greater by 83,610 lbs., and the value was less by \$5,294. During the corresponding week of 1898 top grade zinc ore sold for \$27.50 per ton, and the lead sold for \$23.50 per 1,000. The turn-in was less than for last week by 3,441,640 lbs. of zinc, 99,850 lbs. of lead and the value was less by \$130,529. For the corresponding 33 weeks of last year the lead sales were greater than this year by 5,342,124 lbs., but the zinc sales were less by 63,132,150 lbs., and the value was less by \$3,333,045. Following is the turn-in by camps:

	Zone, lbs.	Lead, lbs.	Value
Joplin	1,722,830	261,090	\$44,975
Gatica-Limpire	2,369,510	260,730	55,591
Carterville	1,715,700	287,870	30,244
Oronogo	739,930	—	17,571
Webb City	676,630	58,310	15,701
Duenweg	3,071,990	34,400	21,403
Central City	386,210	10,160	8,374
Cave Springs	143,590	4,200	3,130
Belleville	292,280	5,130	3,992
St. Joe City	7,700	6,450	—
Hill's Neck	—	—	4,345
Alexia	—	—	5,420
Star City	—	21,070	20,310
Granby	—	2,100	2,043
Morgan County	4	5,000	1,943
Cole County	—	2,740	—
Harry County	—	4,920	—
Dade County	1,120	—	1,936
Carthage	—	—	—
Weotton	—	—	—
Total for week	1,722,830	1,220,730	\$132,766
Total 13 weeks	1,722,830	1,220,730	\$1,464,44

MONTANA.

All the machine for the Buzz Saw mine on Shaughnessy hill has arrived in Libby and nearly all has been taken to the mine. There were seven car loads of it and one of the pieces weighed 29,000 pounds. It had to be taken to pieces, however, before it could be hauled with the teams. Everything is progressing favorably with the construction of the concentrator, and Mr. Dikeman, the superintendent, says that the plant will be running by the 15th of September. Work in the mine is being prosecuted with all possible speed and the connection between the lower tunnel and the one above it will be made in time to afford good air for the large crew it will be necessary to put on when the mill is started up. There is a shortage of good miners in

the Libby camp and Mr. Dikeman is anxious to secure the services of about 20 at once for the Buzz Saw mine.

A small force has been put to work on the Way-Up mine, which is located on the divide between Libby creek and the West Fisher, and which is considered one of the best gold properties in the Libby district. It is owned by the Montana Kootenai Mining Company, of which James Higgins and Joseph Riley of Butte were the principal promoters. This property was quite extensively developed last year under the supervision of Mr. Riley, and the developments were sufficient to justify him and others in organizing the company above mentioned.

The Way-Up was purchased from the Bryant brothers last year for \$7,500, and is developed by a 200 foot tunnel, which has been run in on the lead, and there is a good showing of ore in the face of the tunnel. The claim is situated in the midst of several very promising claims and there is every encouragement to warrant the further expenditure of money in its development.—*Anaconda Standard*.

NEVADA.

Soda Springs, Esmeralda county, is one of the lively little camps of southern Nevada, and the outlook is favorable. The Vulcan Copper Company has a large force of men developing their mines, are spending money in doing so, and will make copper mining pay. All that was ever required to make Nevada mines profitable was the expenditure of money enough to develop the properties, and it is pleasant to see this company has adopted that course.

The prospect owned by Humphrey & Booker is showing up well. They are running a cut through their croppings and have a large vein of copper ore. How high it runs was not ascertained.

Elmer Dunlap has a car load of copper ore on his dump, which he intends to ship soon. It is high grade enough to pay the great cost of shipping and reduction and still leave a profit. Some of those so called experts, who are running around, don't seem to like ore of that character, or else they don't know it when they see it, from the way some of them talk about the district.

Everything seems to be going on as usual at Silver Star, and the mill has been running on good rock for quite a while.

The outside camps are deserted. A few men are prospecting in the hills.

NEW MEXICO.

Thomas Cooney and George Schable are meeting with great success on their lease on the Silver Bar mine, better known as the old Cooney mine, at Cooney, Grant county.

Frank Bell is developing large bodies of rich copper sulphides in the Philadelphia mine near Hanover. This mine has a fine record for shipments of rich copper ore. It is attracting the attention of capitalists seeking investment.

B. C. Gillette & Co. increased the force of miners upon the Copper Rose and Native Copper mines at Sauta Rita. Ten more miners were put at work. These properties are showing up large bodies of ore and producing handsome returns to the lessees as well as a big royalty to the owner.

On the Little Fanny near Mogollon the

main working shaft is being sunk as fast as possible. It has now attained a depth of 100 feet. When the 400 foot level is reached drifts will be run upon the ore bodies, which in this mine have always been of great extent and of good grade.

The two furnaces at the Silver City Reduction Works, having the Bretherton hot blast improvement, put through 180 tons of ore and fluxes. Furnace No. 1 ran 85 tons and furnace No. 2 ran 95 tons. The ordinary capacity of these furnaces without the hot blast is 40 to 45 tons per day. The capacity of the plant will soon be increased, another water-jacket furnace was shipped by Fraser & Chalmers from Chicago on the 5th inst. and put in place immediately. The Silver City Reduction Works is fast growing in favor with the mine owners in the southwest. Fair treatment and prompt attention to the business of patrons has produced these good results.—*Silver City Enterprise*.

OREGON.

The old Mammoth mine, a patented property, owned for many years by S. A. Heilner, a prominent merchant of Baker city, and sold by him a few months ago to Boston capitalists through the instrumentality of Mr. H. S. McCallum, is being developed on an extensive scale under the management of Mr. Fred S. Lack. A force of twenty men—three shifts—is employed in sinking a shaft on the ledge, a depth of 75 feet being now reached. In 25 feet more, crosscutting the ledge both ways from the shaft will be started. Deep sinking will be continued, however, for an indefinite time.

SOUTH DAKOTA.

A Chicago company is working on the Gold Standard and group with very good results. The company owns and has patented over 600 acres, which has been opened up at various places by shafts and tunnels. The ore is free milling, with considerable concentrates.

The American Mining and Milling Company, better known, perhaps, as Kilpatrick-Collins, has done a great deal of substantial work on a group of claims of considerable extent. They have a two-year option on the claims, and have already sunk a number of shafts which have shown good values. One shaft is down about eighty feet, in the bottom of which a hole has been drilled down about 100 feet, all in ore. The company will commence again in September of this year, to do further development work.

UTAH.

Tintic District.

The hoist at the Victoria is fast nearing completion, and it will be no surprise to hear the whistle sounding regularly within the next ten days.

A strike of a large body of galena is reported at the May Day. The intention of the management is to begin the shipment of it at once.

Work on the Emerald is to be resumed immediately. At present the bulk of the work will be on the 500-foot level, where a large body of mineralized quartz is in evidence.

The Joe Bowers Extension Company will,

in the near future, put in another boiler. This is made necessary in order to handle the water in the shaft which is now down more than 400 feet.

The La Reine people are wearing broad smiles these days, caused by the possibility of this company becoming a permanent shipper in the very near future. The vein has been cut a distance of fourteen feet without reaching the hanging wall, and 'tis all shipping ore. Assays have given over 100 ounces silver and a good showing in copper.

The Raymond will start up in the course of a couple of weeks, it is believed, as the new hoisting machinery will soon be in place, and active operations will begin immediately upon the completion of this work.—*Jaub County Republican.*

WASHINGTON.

The winze from the number three level in the Republic has reached a depth equal to 450 feet from the surface and drifts are being run in both directions. The face of each drift is in ore. The ore opened up is among the richest found in this noted mine as it yields \$300 in gold to the ton. The tunnel is being driven forward at a rate of about twelve feet per day.

Contracts have been let for the new mill on the Mt. Lion. It will take 300,000 feet of lumber. The capacity of the mill will be 100 tons and it is expected to be running by Jan. 1st, when another dividend-payer will be added to the Republic Camp.

Tom Thumb is cross-cutting the ledge on the 140-foot level. On the 100-foot level development is also going ahead. Here the ore chute for a distance of 90 feet has been opened up.

The rich ore from the recent strike in the Princess Maud is being sorted into two grades. The richer or first-class will include some 500 or 600 pounds of rock, hand sample of which gave eight ounces in gold and 100 ounces in silver. The second grade will run about \$20 to the ton.

Morning Glory is also sorting its ore into several grades. The first quality, which carries the black quartz, will probably go \$500 to the ton. The pay chute is about 15 inches wide and runs very uniform in width. Their pump has been received and installed and is doing good work. Its capacity is fully 600 gallons per hour.

Representatives from Anaconda and Butte have made contracts for ore shipments to keep the custom mill to be erected by them busy for two years. An electric tramway is contemplated to run through the camp and tap the numerous mines and so convey the ore to the mill at least possible cost. A mill will enable a large number of properties to pay their way and will stimulate and encourage development of the properties now idle.

Upon examination of the work done upon the Insurgent at Republic camp, and in particular upon the vein in the east Lone Pine drift as developed upon the Insurgent ground it was found by actual measurement for the last 40 feet that the vein is more than six feet wide, solid quartz, carrying gold values alone of \$54.70 per ton. This is the average of all

of the 30 feet in length and six feet in width.

A crosscut has been driven, running some considerable distance, in which a large body of quartz was struck a few days ago. The assays from this body of ore show ore as rich as found in the other vein.

The Insurgent property is rapidly approaching a point where there will be sufficient ore in sight to warrant the construction of a mill and its continuous operation.

FOREIGN MINING NEWS

BRITISH COLUMBIA.

Rossland shipments of ore for the week ending Aug. 26th were 4,764 tons and for the year 97,572 tons.

A large body of rich copper ore was recently discovered within a few feet of the tunnel on the Black Bear claim belonging to the Le Roi Company. Fourteen feet of chalcopyrite was uncovered assaying \$10 in gold and 11 per cent copper.

Deer Park are employing twenty-two men and this number will soon be increased to thirty. Work on the south drift of the 300-foot level is being pushed toward a rich body of ore with all possible speed. Shipments of ore from Solcan Lake thus far amount to about 2,000 tons.

The War Eagle mine shipped last week 65 cars of ore approximating 1950 tons; about 10 cars of ore per day are being produced.

The new tunnel at the south end of the Metallic on Lake Pend d'Oreille has reached the ledge at a depth of 125 feet, and is reported 16 feet wide. A lot of ore, claimed to be an average, shows an abundance of grey copper and will undoubtedly carry high values in silver, gold and lead. An assay has not been finished yet, but will undoubtedly show high values. The old tunnel has also reached the ledge and the ore looks about as good as in the new, but not so much grey copper. These strikes indicate a large body of ore running the full length of the claim. After cross-cutting the ledge in the new tunnel workmen proceeded to drift both ways on the ledge.

North Star of East Kootenay has shipped over 700 tons of galena to Grand Forks smelter yielding an average of \$60 a ton. Superintendent Kellogg gives the following figures: On the old vein at the 30-foot level there is a 500-foot drift, 400 feet of which is in continuous ore. On the 60-foot level there is a cross-cut tunnel of 400 feet in length, with 200 feet of a drift which is all in the same ore. Higher up the mountain there is another vein. A crosscut of 100 feet from a 200-foot shaft has reached this vein, on which work is now progressing. The ore in the second vein is of higher grade galena, and carries values of gold throughout. This property, he says, can make regular shipments of 50 to 60 tons per day. Reliable parties claim the first vein has a width of 90 feet and the ore blocked out amounts to 40,000 tons.

LOWER CALIFORNIA.

Two carloads of material, consisting of four hoist drums and four steel shaft faces consigned to the Santa Rosalia Company,

Lower California, are in the yard at Nogales, waiting transportation. The material was made in France and came by way of New Orleans.

MEXICO.

J. W. Kearney, one of the owners of the Tacuba mine, 60 miles southeast of Magdalena, said the mine with hoisting and milling machinery is for sale on reasonable terms, that, considering the actual value of the property are exceedingly cheap. A disagreement among the owners, Mr. Kearney says, is the reason for the desired sale.

L. M. Reid of Minneapolis, principal owner of the Santa Gertrudis property, 27 miles east of Imuris, expects the hoist will be in operation within 30 days. The main shaft is now down 80 feet on the ledge, and it is the intention to continue to a depth of 250 feet with crosscuts during the next year. The ledge is now 48 inches in width, Mr. Reid says, and assays show silver running from 350 to 700 ounces per ton, with a good showing of gold.

Anthony Bray's recent success in two large properties in Magdalena district, Sonora, add additional fame to that exceedingly rich region. While speaking to a friend the other day he said one of the properties, El Otate, is located 20 miles east of Llano station. The principal owner is H. F. Bulwer, an Englishman at present living in Chicago. The mine was located on ancient workings which history says was a great gold producer. "An examination of the old workings," said Mr. Bray, "showed that the vein stands almost vertical, and is quite wide. I didn't follow the old workings but went down at a safe distance away on hard ground, and have reached a depth of 200 feet. At this depth extensive crosscutting work is in progress. We have struck the vein that now gives values of from \$10 to \$600 per ton, and I will continue crosscutting until it is certain all the veins have been cut; then I will raise to the old works. This mine is a fine showing, and will be a large producer of free milling ore."

"The other one, El Cajon de las Amarillas, owned by the Mexican Gold Mining Company, E. A. Stent of San Francisco, President, is located 55 miles in a southwesterly direction from Llano. The mine was worked during the last century by the Salazar family. A strong vein is traceable through almost the entire length of the property. On the south end the ore worked down base, but on the north end old shafts to the depth of 80 and 90 feet cut a ledge of from three to five feet in width that carries from \$8 to \$15 free gold. A cyanide company recently worked the Salazar tailings and cleaned up an average of \$10 per ton."

"I opened a new shaft," said Mr. Bray, "which is now down 100 feet, and I expect to carry it 300 feet before I commence crosscutting. As in El Otate, I want to get below the old workings. The hoisting plant installed there is pronounced by competent judges to be one of the best in Sonora. Mr. Stent, when there three weeks ago, was highly pleased with the prospects. The hoisting plant on the El Otate is also a fine piece of machinery. Mills will be placed on both properties as soon as we decide upon the character of the machinery necessary. I am highly pleased with the prospects, and have only to add that both mines are rich."

GENERAL NEWS.

THE WORK OF THE INTERNATIONAL ASSOCIATION FOR TESTING MATERIALS.

There are two peculiarities regarding membership in this Association that deserve notice. First, there is no nomination or election of members, but any person desiring to be a member may do so on signing a statement that he assumes membership and will be governed by the laws of the Association; in so doing he further assumes the obligation, stated in Art. 5 of the statutes that he will advance its interests to the best of his ability. Membership is hence a voluntary act assumed by an individual in order to promote the knowledge of the properties of materials and to endeavor to secure uniformity in methods of testing them. Withdrawal from membership may be made at any time by mere announcement to the proper officer of the Association.

The second noteworthy feature regarding membership is that it may be assumed by a corporation or society as well as by a person. For example, in the list of members of the American Section, published in February last, will be found the Franklin Institute, the American Foundrymen's Association, and five local engineering clubs, as also several steel companies, engineering journals, and firms engaged in inspecting and testing. In Europe this feature is carried much further, the membership of the German section including the bureau of public works of several cities, provinces and states, the police bureau of Berlin, the Prussian war department and the boards of direction of numerous railways, as also a large number of manufacturing corporations and engineering societies. Under this arrangement it is possible for a corporation to exert a greater influence than through the indirect individual membership of its president or superintendent, both manufacturers and consumers can make their wishes more directly known, and thus differences in regard to methods of inspection and testing can be more quickly harmonized than under the usual plan of strict individual membership. However, fully three-fourths of the total members are individuals, and these include engineers in all branches, architects, chemists, professors of mechanics and engineering, and superintendents and foremen of works.

At the Zurich congress the dues of members were fixed at \$1 per year, and while no change was made at the Stockholm congress, the council recommended early in 1898, in view of the heavy expenses, that each member should pay \$1.50 per year. Accordingly, at the first annual meeting of this Section, when our present by-laws were adopted, the provision was inserted that each member should pay \$2.50 per year, of which \$1.50 should be transmitted to the International Association and the remainder be used to defray the expenses of the American Section. This by-law went into effect on Jan. 1, 1899, and accordingly no dues were collected by this section for the year 1898, the \$1.50 payable for that year being forwarded to the International Council directly by each member or through the American member of that council. During the present year dues have been paid directly to our Secretary, and his report, together with that of our Treasurer, will be laid before this meeting.

The dues of \$1.50 per year per member

transmitted to the International Council are used by it in issuing its publications and in assisting its committees in defraying a part of the expenses of their special investigations. In addition to this income a number of societies and bureaus have agreed to make extra annual contributions, the Prussian war department heading the list with \$125, and 21 others giving smaller sums, so that for the year 1898 the amount derived from these sources was about \$400. Although official information is not at hand it is safe to say that the total income of the International Association for the year 1898 did not exceed \$2000 which is certainly a small sum with which to issue its publications and carry on the work of 21 committees.

The International Association has issued yearly since 1895 a list of members, and abstracts of the proceedings of the congresses of 1895 and 1897. These, together with a few circulars of information, constitute all the publications that it has been able to furnish free to its members. The detailed proceedings of the congresses have been printed in the journal *Baumaterialenkunde*, published in the French and German languages at Stuttgart, which has been furnished to members at \$2.50 per year, the regular subscription price being \$3.50. It will be seen, therefore, that an American member who desires to be fully informed regarding the work of the Association must necessarily subscribe to this journal, and by so doing his dues become really \$5 per year. It should further be stated that arrangements will probably be made so that the official announcements of the International Council and the proceedings of future congresses will be printed in this journal in the English language as well as in German and French.

The American Section as already stated, had no income during 1898, and the report of our Treasurer shows that during the present year the amount available for expenses has been about \$120. On Feb. 18 a pamphlet of 26 pages was issued containing a list of officers of the International Association and its committees and a list of the American members, together with the statutes, by-laws and some historical information. In April a bulletin was issued giving abstracts of the proceedings of the first annual meeting and of the meetings of the executive committee, and in July a second bulletin was issued containing the preliminary programme for this meeting. It is hoped that the condition of our treasury may permit these bulletins to be continued, and that one may be issued containing the proceedings of this meeting.

The technical questions proposed for discussion at the Paris congress of 1900 are 19 in number. The organization of the international committees which are to consider these topics is now complete, and preliminary reports from the American members of several of them are to be presented and discussed at this meeting. Probably the most important of these subjects is that of standard international specifications for testing and inspecting iron and steel; this committee originally consisted of about 40 members, of which five were assigned to this country, but under authority to increase its numbers the American sub-committee has been increased to 21, has held several meetings, collected specifications, and will present a preliminary report of much interest. It is also expected that the American members of five other international committees on iron and steel will report progress in their organization and work. As the national sub-committees are now in

full correspondence with the international chairmen, it is expected that the final reports which are to be presented for discussion at the Paris congress will prove of great interest and value.

Of the 19 problems to be considered by the 19 international committees six are on iron and steel, one on stone and slate, eight on cements and mortars, one on tile pipe, one on paints, one on lubricants, and one on the dry rot of wood. The fact that there are eight committees on cements and mortars and only six on iron and steel may seem abnormal, but it should be remembered that in the testing of hydraulic cement the personal equation of the observer enters to a far greater degree than in the case of metals and that its rapidly increasing use demands immediate perfection of methods which will render comparable the work of different laboratories. At the session Aug. 16th, preliminary reports from some of the sub-committees will be presented.

(To be Continued.)

JOINT STOCK COMPANY LAWS.

The extent to which capital is invested in joint stock mining enterprises, and the too frequent or quite common occurrence of the promotion of fake or fraudulent companies in this important enterprise makes it necessary at the present time that a National or Federal law should be enacted to control the formation and organization of all mining companies in the United States, under a uniform law and regulations in all the separate states.

The Banking and Insurance interests of the country are regulated and controlled by Federal law, and the extent to which capital is invested in mining ventures shows the necessity for the services of a Commission of Inquiry, composed of experienced mining men, to report on this branch of industry to the equally important and necessary Department of mines and Mining. Recent attempts to restrict the industry in some States, and the operation of objectionable clauses or sections in the joint stock company laws of other States are evidences of the retarding influences to which capital is subjected. To such an extent is this the case that a company operating in one State is forced to seek incorporation in an adjoining or outside State, so as to get the benefit of more liberal laws affecting the organization and operation of incorporated companies.

The formation of gigantic trusts and combines all over the country, to control one branch of industry, is an instance of the evil of combining several joint stock enterprises, or illegal action in doing so, when the Trust or new organization has not obtained incorporation powers to entitle it to do so. The laws of any State which permit such combination or monopoly is another reason for the enactment of a uniform Federal law for all incorporated companies, irrespective of the State or Territory in which they are operating. To control the gambling feature in stock companies, and make capital invested represent cash and in all cases represent so much value in stock, and thereby give to stock certificates a value equal to bank notes is an end much to be desired. If the State or Federal authorities only were allowed to issue certificates for company stock on receipt of an equivalent in cash or property, then fake companies and gambling would cease and mining shares would represent actual cash or value invested, and the best interests of the industry would be advanced.

Wm. Ainsworth & Sons of Denver, Colo., have increased the discount on the price of their high-class button balances 25 per cent, and on pulp and chemical balances 15 per cent from catalogue "A" list.

This reduction in price is made possible by the modern equipment of their factory for the manufacture of balances and by the decreased cost of manufacture and excellent facilities they now have for placing their products in the markets of the world.

Although the reduction in price of their balances will make them as cheap as inferior instruments, their high standard will be maintained and the firm's reputation as makers of the most accurate assay balances shall never be questioned.

They are now prepared to furnish balances for scientific purposes, sensitive to 1-1000 milligramme under full guarantee.

Who can calculate the amount of money-earning time wasted every day in the shops of the land, through stopping to take up belts because they are slipping. If a belt did not slip, it would be unnecessary to take it up until the sides touched, and there would be besides relief of strain on belt and bearings, more belt surface producing friction on pulley face, and hence more power. The Cling-Surface Manufacturing Co., of 167-172 Virginia St., Buffalo, N. Y., report they have thousands of belts fulfilling these conditions through the use of Cling-Surface. The Journal Printing Co., of Muscatine, Iowa, writes: "We have been using your Cling-Surface on our belts for the past two months, and unhesitatingly pronounce it an ideal article. We are able to run our machinery now with ease and accuracy, that formerly was very imperfect because of belts slipping. We now transmit our power a long distance by belts that are slack, and can start up heavy machinery with ease where before they had to be listed over by hand. Cling-Surface is all and more than is claimed for it, and we can most heartily recommend its use to all who drive machinery by belting. Our belts were never in better shape. Cling-Surface did it."

Latest Mining Decisions.

Prepared by Andrews & Murdoch, Berrien Springs, Mich.

In a charge that, if no evidence of a vein appear for any considerable distance, the veins are not identical, the use of the word "considerable" is not objectionable as being indefinite. Butte & B. Mining Co. vs. Societe Anonyme Des Mines de Lexington, 58 Pac. Rep. (Mont.) 111.

Where the court sustained a motion for a new trial, and did not expressly exclude the ground that the verdict was against the evidence, the ruling will be sustained on appeal, where it appears to be a conflict of evidence. Butte & B. Mining Co. vs. Societe Anonyme Des Mines de Lexington, 58 Pac. Rep. (Mont.) 111.

Where plaintiff purchased ore of one who obtained it of the lessees of a mine, his title was not affected by a forfeiture of the lease after the ore had been mined, in the absence of evidence that such forfeiture carried with it the right to ore previously mined. Yank vs. Bordeaux, Constable, 58 Pac. Rep. (Mont.) 42.

In order that a vein may be followed extralaterally, identity throughout is essential, and the vein must be continuous; but the contin-

uity may be interrupted, provided the interruption does not prevent the tracing of the vein through the fissure as geologically identical. Butte & B. Mining Co. vs. Societe Anonyme Des Mines de Lexington, 58 Pac. Rep. (Mont.) 111.

Where the court, in a charge, has correctly defined a vein, and indicated that, in order that a vein may be followed extralaterally, it must be the identical vein throughout, it is not error to place stress on the physical continuity, and to neglect to charge as fully in regard to the other elements of identity, when no charge is requested. Butte & B. Mining Co. vs. Societe Anonyme Des Mines De Lexington, 58 Pac. Rep. (Mont.) 111.

A charge that veins are permanently separated, and cannot be followed as the same vein, when, in order to connect them, it is necessary to pass through a considerable distance of rock showing no elements of a vein, where there are neither minerals, walls nor seams, is not erroneous, as being practically a charge that the jury must reach a certain conclusion as to the continuity of the vein. Butte & B. Mining Co. vs. Societe Anonyme Des Mines de Lexington, 58 Pac. Rep. (Rep. (Mont.) 111.

The lessees of a mine agreed with plaintiff's assignor to operate the mine, in consideration of plaintiff's assignor furnishing all necessary supplies, the net proceeds of the ore, after milling, to be equally divided between the lessees and plaintiff's assignor. Held, that in determining the net proceeds only the cost of smelting, and not the costs of mining hoisting, and handling the ore, should be deducted from the gross proceeds. Yank vs. Bordeaux, Constable, 58 Pac. Rep. (Mont.) 42.

A bill in equity charged that defendant, an adjoining owner, trespassed and mined on complainant's lands, so as to throw the water from defendant's mines in and on the mineral lands of complainant, causing it great damages, which will continue unless restrained. The answer admitted the mining on complainant's land, but avers that the water could not flood complainant's mine unless the latter should "negligently and foolishly" drive its entries in to the opening and mines of defendant. Held, that the answer is not sufficiently direct and positive to warrant the dissolution of the temporary injunction. Mabel Min. Co. vs. Pearson Coal and Iron Co., 25 So. Rep. (Ala.) 754.

Rev. St. U. S. § 2326, directs one entering in the land office an adverse claim to an application for a patent for a mining location to commence an action to determine the question of right of possession, the party having judgment to be entitled to a patent. Act Cong. March 3, 1881 (21 Stat. 505), amending the former act, provides that, if title to the location is not established by either party, the jury shall so find, and judgment be rendered accordingly, and claimant shall not be entitled to a patent until he perfects his title. Held, that an action under said statutes, the judgment in which would have no other effect than therein provided, was not a common-law action, within Supp. Rev. St. U. S. p. 13, § 1868, providing that no party should be deprived of a right to jury trial in common-law actions; so that a verdict rendered by three-fourths of the jury was sufficient, under Act No. 51, Sess. Laws Ariz. 1891, making such a verdict sufficient in civil cases. Providence Gold Min. Co. vs. Burke, 57 Pac. Rep. (Ariz.) 641.

In order that a vein may be followed extralaterally, identity throughout is essential, and the vein must be continuous; but the contin-

PERSONAL NEWS ITEMS

ALFRED BUTTERMER who for four years acted as superintendent of the properties of the Gresham Gold Exploring Syndicate of London at Coolgardie, West Australia, has just returned to San Diego, Cal.

Supt. BASSETT of Los Angeles, Cal., has charge of the Kenton mine at Allegheny, Cal.

PROF. W. F. ROBERTSON, provincial geologist, is making his annual inspection of the mining divisions of British-Columbia province, and is also gathering ore samples for the Paris Exposition.

DR. PLEIBERGER, the noted German geologist, is in San Francisco, Cal. He is circling the globe for the fourth time.

T. A. RICKARD, State Geologist of Colorado, was in the Black Hills, South Dakota, inspecting some mining property south of the Homestake ore body for a Colorado Springs syndicate.

T. B. DILLON has returned to San Francisco, Cal., from an examination of the mines in El Dorado, canon, Nevada.

A. D. MOTTET, Supt. of the Granite Mountain Metallic Cons. Company, operating near Philipsburg, Mont., spent a few days recently visiting in Salt Lake City, Utah.

CHARLES HADSON one of the old-time miners of the Pacific Coast, is in Los Angeles, Cal.

ROBERT MARTIN, an ex-police officer is spending a few days in his Los Angeles home having come down from his Shasta county mines.

M. PAUL DE SINCAY, the president and executive head of the Vieille-Montagne Zinc Company of Belgium, spent last week in looking over the zinc-lead district around Joplin, Mo.

E. H. BENJAMIN, Sec'y of the California State Miners' Association, has returned to San Francisco from El Dorado county, Cal.

T. ELLIS BROWNE, a prominent mining lawyer of Salt Lake City, Utah, has returned to that city after an extended pleasure trip through England.

L. EMERSON was in Los Angeles last week from Holcomb Valley, San Bernardino county, Cal., where he has some gold claims.

PROF. F. M. CLARK, chief chemist of the Smithsonian Institute, Washington, D. C., visited the Cripple Creek, Colo., region recently.

F. MURPHY, a South African mining engineer, is examining a copper property at Sodaville, Esmeralda county, Nev.

A. W. RUSSELL of Cripple Creek, Colo., is spending a few days in Salt Lake City, Utah.

WADE HAYES of Los Angeles, Cal., will return this week to his gold mines on Feather river in North California. Mr. Hayes is a great-grandson of Daniel Boone, the famous hunter of Kentucky.

SETH HOSKINS has been appointed chief engineer of the Colorado Fuel and Iron Company at Pueblo, Colo.

A. E. VANDERCOOK, superintendent of the cyanide plant at El Dorado canon, Nev., is in San Francisco, Cal., on business.

C. C. HIGGINS and JUDGE STREET have returned to Salt Lake City, Utah, after an extended trip through the mining camps of Idaho.

L. L. BEQUETTE, who has been in Los Angeles, Cal., the past week, has returned to his Kern county gold mines.

C. W. GAMMON, the mining man, who has been stopping in Philadelphia recently, is now visiting in Bridgeport, Conn.

COL. T. W. BROOKS, the well-known mining expert of Yuma, was in Los Angeles, Cal., the other day on his way to look at some Northern California mines.

WM. M. THORNTON of Anaconda, Mont., is in San Francisco, Cal.

V. C. HEIKES, Honorary Special Agent of the Department of Mines and Metallurgy for the Commissioner General of the United States to the Paris Exposition, has left Arizona and gone to New Mexico in his quest for mineral exhibits.

A. J. SCHUMACHER, M. E., of Butte, Mont., was in Salt Lake City, Utah, on business.

R. J. DVAS, a prominent mining man of St. Louis, was in Needles, Cal., on his way down the Colorado river to Gier's Landing, where he is developing some properties.

The Mining And Metallurgical Journal

THE MARKETS.

All quotations, financial reports and other statistical figures given under this head are New York Quotations, unless otherwise stated in each item. These figures are carefully revised each issue, and constitute a very accurate compilation of statistical matter.

NEW YORK, August 14th, 1899.
The following are the Silver, Copper and Lead quotations for the last two weeks:

	SILVER.	COPPER.	LEAD
Aug. 1	\$014	18 50	4 86
" 2 "	\$014	18 50	4 40
" 4 "	\$014	18 50	4 40
" 5 "	\$014	18 50	4 45
" 6 "	\$014	18 50	4 45
" 7 "	\$014	18 50	4 50
" 8 "	\$014	18 50	4 50
" 9 "	\$014	18 50	4 50
" 11 "	\$014	18 50	4 50
" 12 "	\$014	18 50	4 50
" 13 "	\$014	18 50	4 50
" 14 "	\$014	18 50	4 50

SILVER

The silver market has a slight receding tendency. Absorption of silver by the Orient is hardly sufficient to sustain the market without Continental orders.

COPPER

The market continues very strong, consumption is very large in all branches for this season of the year. Lake copper is offered at 18 1/2c. We quote for electrolytic in cakes, wirebars or ingots, 17 3/4c@17 1/4c, while casting copper is nominal at about 17 1/4@17 3/4c.

LEAD

The demand for lead at this season of the year is, as usual, very large. Prices have advanced somewhat and the metal is now quoted at 4.55@4.60. The for-

ign market is firmer and a good business has been done for export. Spanish lead is being quoted at £14 10s. @ £14 11s 3d.; English lead is quoted at 5s. higher

SPLITTER.

The lower prices have attracted considerable attention and we hear of numerous transactions. Consumers generally are poorly covered, and with a large consumption in sight for the fall months a betterment in value is looked for. New York is quoted at 5.80c., while the foreign market has declined to £23 10s. for good ordinary and £23 15s. for special

ANTIMONY.

Antimony is quiet and steady at 10 1/2c. @11c. for Cookson's, 9 1/2c. for Hallett's, U. S., Star and Hungarian.

NICKEL

Nickel continues unchanged and no alteration of prices can be reported. We quote for ton lots 33@36c per lb., and for smaller orders 35@38c. London prices are 14@16d. per lb., according to size of order.

TIN.

The London market fluctuated considerably during the past week, but closed £142 5s. for spot and £143 5s. for three months prompt. New York is quoted at 31 1/2c.

PLATINUM.

The demand for Platinum is active and prices continue high. New York is quoted \$15.50 per ounce for large lots and \$16@17 for smaller orders. The London quotation is 62@64s. an ounce.

POTASSIUM CYANIDE.

Purified, 98@99 per cent., in cases of 120 lb. at 30c. per lb. in 5, 10, 25 and 50 lbs tins at an advance.

QUICKSILVER.

The wholesale price in New York has

advanced \$1 and is now \$40.50 per flask. The London price has risen to £8 10s. per flask, with the same rate from second hands

POWDER.

F. o. b., San Francisco: No. 1, 70 per cent. nitro-glycerine per lb., in carload lots, 15 1/4c; less than one ton, 17 1/4c. Black blasting powder in carload lots, minimum car, 728 kegs, \$1.50 per keg less car lots, \$2 per keg

COKE.

There has been quiet trade in coke with a slight improvement reported.

IRON CAR LOTS, ST. LOUIS

Connellsville fdly coke	72-hr. fr.	\$1.70	
New River	\$4.00	Pocahontas	3.90
Crushed			1.71
Gas works coke, lump, per bushel			.10

IRON

The San Francisco market in Borax is firm with a good demand, powdered refined in car lots 71c.

THE MINOR METALS.

Quotations are given below for New York delivery:

Aluminum,	16@17c
No. 1, 99 per cent. Ingots, per lb.	31@32c
Rolled sheets, per lb	32c up
Aluminized Nickel, per lb.	33@34c
Alum bronze	34@36c
Bismuth, per lb.	\$1.45@1.50
Phosphorus, per lb.	45@55c
Magnesium	27.7@30.10
Tungsten, per lb.	70c
Ferro-tungsten, 60 per cent.	70c

Variations in price depend chiefly on the size of the order.

ACIDS

Prices show no change and there is only a moderate business doing. Some inquiries for sulphuric acid are reported.

Blue vitriol continues rather unsettled and offerings are again said to have been made a shade below quotations.

There is some excitement in copperas,

offerings of large quantities having been made by agents in New York representing a new producer whose identity is not disclosed. The works are said to be near Pittsburgh.

CHLORATE OF SODA.

The market is uneventful. Demand continues fair and prices unchanged. Spot best unmixed seconds can be had at \$21.75 @ \$22.00 per ton, and shipments at \$20.00 @ \$20.75, while thirds are from \$1.75 @ \$2.00 less

NITRATE OF SODA.

There is still some talk of higher prices but dealers continue to take orders at \$1.57 1/2 @ \$1.62 1/2 per 100 lbs., while spot stock is offering at \$1.90 @ \$1.62 1/2, and one or two large sellers ask \$1.65 per 100 lbs.

CHEMICALS

In domestic high test alkali large sales are made for next fire at 72 1/2c. per 100 lbs. f. o. b. works; for prompt delivery second hands are asking up to 95c. Caustic soda, domestic, is small in supply, hence higher prices are quoted. Soda ash shows renewed competition among makers and lower prices are expected.

Caustic soda high test is quoted per 100 lbs. f. o. b. works at 72 1/2c. in New York, 85@90c., while foreign brands are quoted at 67@70c. Bi-carbonate of soda is quoted per 100 lbs. f. o. b. works, 1.12 1/2@2.25. Chlorate of potash crystals in New York are quoted for domestic, 9.00@9.25; foreign, 9.25@9.37 1/2, powdered domestic at 9.25@9.50, and foreign, 9.50@9.75.

CHLORIDE OF LIME.

English prime brands are quoted at 1.50@1.55 with 1.40@1.50 for other brands.

MINES MUST HAVE WATER PROOF BELTS

CLING-SURFACE will enter and fill a Belt (Leather, Cotton or Rope,) and make it Absolutely Waterproof; Will preserve the Belt, and by preventing all slipping, will allow the Belt to be run slack, giving greater pulley contact and therefore transmitting more power. We guarantee this.

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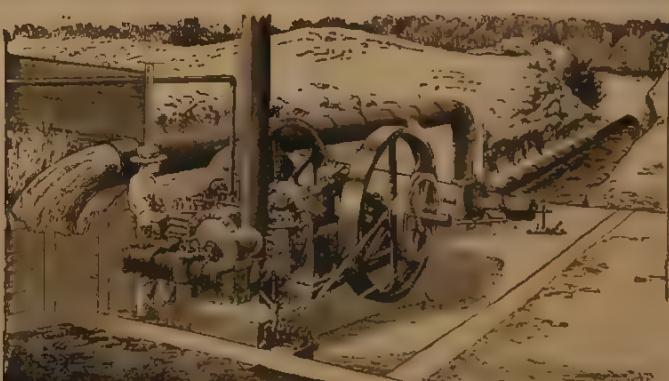
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This illustration shows L. & C. Furnace in operation. Melting and Cupeling at same time with one burner.



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The illustration shows the gigantic pumping plant recently built by the Hercules Gas Engine Works at the Packer Ranch, Colusa Co., 80 h. p. Hercules Engine, pumping 7200 gallons a minute, 27 feet high. Burns Gasoline or Distillate oil. Cheapest power known. Gas, Gasoline and Oil Engines, 2 to 200 h. p. Send for Catalogue. HERCULES GAS ENGINE WORKS, 210 Bay St., NEW YORK.

RIVETED SHEET STEEL WATER PIPE
For Divers, Water Powers, Irrigation, Etc.
THE WEIGELE PIPE WORKS
2949-51 Larimer St. DENVER, COLO.

THE MINING AND METALLURGICAL JOURNAL.

FINANCIAL NOTES.

Average Prices of Metals
in New York per 100 lbs. from January 1st, 1899.

Month	Copper	Tin	Lead	Spelter
January	14.79	22.48	4.18	5.74
February	18.50	24.20	4.49	5.21
March	17.54	23.82	4.37	6.31
April	18.93	24.91	4.31	6.67
May	18.25	25.76	4.44	6.88
June	17.93	25.55	4.42	5.98
July	18.33	26.03	4.52	5.82
August				
September				
October				
November				
December				
Average				

figures herewith are furnished by the Bureau of Statistics Treasury Department.

Comparative statement of changes of money in United States Treasury during July 1st 1899, comparison being made with statement, on June 1st, 1899.

	July 1.	Changes.
Gold	\$153,524,500	I. \$14,063,681
Silver	422,939,977	I. 739,681
Legal Tenders	36,133,667	I. 548,975
Treasury & N.Y. Bk Notes	4,430,764	D. 321,924
Totals	\$617,027,005	I. 14,829,353

The Gold and Silver bullion on hand in the Treasury is not included in this statement.

Average Monthly Prices of Silver.

In New York per ounce Troy, from January 1st, 1899, and for the years 1898 and 1897.

Month	1899	1898	1897
Cents	Cents	Cents	Cents
January	59.26	56.77	64.79
February	59.42	56.07	64.67
March	19.61	64.90	63.06
April	60.10	66.72	66.85
May	61.25	66.94	60.42
June	60.47	58.01	59.10
July	60.26	59.06	59.61
August	59.14	54.19	54.19
September	60.68	60.24	60.24
October	60.42	57.67	57.67
November	60.60	57.91	57.91
December	59.42	58.01	58.01
Year	58.26	59.79	

Comparative statement of the circulation in the United States on July 1st 1899. Comparison being made with statement on June 1st, 1899.

	July 1.	Changes.
Gold	\$701,660,159	D. \$22,972,55
Silver	134,057,431	I. 522,221,719
Legal Tenders	319,54,146	D. 54,975
Treasury & N.Y. Bk Notes	320,428,386	D. 750,091
Totals	\$1,471,031,627	D. \$22,972,55

Gold and Silver certificates and currency are not included in this table. By adding the amounts given in this table with those in the following will give the total amount coined or issued. The figures being furnished by the Bureau of Statistics of the Treasury Department.

Gold and Silver Exports and Imports.

At all United States ports, for the month of June, 1899, and eleven months ending June, 1898, and 1899.

	JUNE.	
Gold—	1898	1899
Exports	\$15,515,520	\$20,908,327
Imports	3,330,612	3,105,626
Excess	I. \$3,195,083	E. \$17,803,641
Silver—		
Exports	\$4,156,650	\$3,843,299
Imports	2,028,803	1,895,006
Excess	E. \$2,127,847	E. \$1,947,293

TWELVE MONTHS ENDING JUNE.

	July 1.	Changes.
Gold	\$701,660,159	D. \$22,972,55
Silver	134,057,431	I. 522,221,719
Legal Tenders	319,54,146	D. 54,975
Treasury & N.Y. Bk Notes	320,428,386	D. 750,091
Totals	\$1,471,031,627	D. \$22,972,55

This statement includes the exports and imports at all United States ports, the figures being furnished by the Bureau of Statistics of the Treasury Department.

The Cleveland Mining and Stock Exchange Co.

New England Building, Cleveland, Ohio.

A Reliable Information Bureau for Miners and Investors to obtain FACTS Regarding Capital and Mines. Stocks and Mines listed. Send for prospectus.

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\$35,000,000 in Dividends paid out by Utah Mines up to date.

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Weekly Market Report on application.
Reference Any Bank in Salt Lake City.

P. J. CONWAY & CO.,

SALT LAKE CITY, UTAH

DRDEN, Colo., July 22, 1898.

The Jackson Drill & Mfg. Co., Denver, Colo.

GENTLEMEN:—I personally operated one of your Jackson Hand Power Rock Drills for ten days in the Humbolt mine, at Lambertine, Colo., and find the machine equal to all you claim for it. We drilled thirty-six inches per hour in blue granite and spar, and that with poor steel. The machine will beat this under ordinary circumstances.

Yours respectfully,
(Signed) F. J. HUGHES.

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in regard to development work location, distance from water, price of fuel, character of ore and returns from shipments. Must have at least 1500 feet of development work. Send all information possible. Address,

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GOLD mine anywhere in United States, must have at least 1000 feet of development; where coal is not over

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METALLURGIST and experienced Assayer and Chemist, with practical experience in Copper and Lead smelting, desires position. Speaks Spanish, highest references, address "Globe", JOURNAL OFFICE.

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Partner wanted, (miner preferred) who would invest \$5,000 in developing a mining property in Mexico. Mine now working and has lately produced a considerable amount of ore. Object deeper development and ultimate placing of property on the market. No attention given to Broker or Middleman. Call or address G. Peter-son, 232 Grant Ave., San Francisco, CAL.

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A 60-TON copper smelting Plant, consisting of two 30-ton furnaces, one of which has new seams later. Plant is complete in every detail. Also an 80-ton Silver-Lead Furnace, entirely new, never having been set up. All of the above located immediately adjacent to railroad. Enquire of GA RDNER, WORTHE & CO., desirous of buying Mill and Supply, Tucson, A. T.

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THE MINING AND METALLURGICAL JOURNAL

MINING STOCK QUOTATIONS

BOSTON

Adventure	10 00	Mass	11 00
Aetna	4 00	Merced	1 00
Aloues	8 50	Mohawk	28 00
Anaconda	60 50	Napa Quicksilver	3 25
Arcadian	65 00	Old Colony Min	14 25
Arnold	13 50	Old Dominion	37 00
Atkins	32 00	Parroni	25 00
Beth.	31 00	Phoneix	1 50
Bonanza	1 50	Quincy	169 00
Boston & Mont's	35 00	Rhode Island	7 25
Breese	11 00	Santa Fe	11 37 1/2
Bute & Boston	77 00	Santa Isabel	14 25
Calumet & Hecla	200 00	Tamarack	200 00
Catolpa	35 00	Tecumseh	5 25
Centennial	33 37 1/2	Tri-Mountain	10 50
Cochiti	12 00	Victor	3 50
Copper Range	45 00	Victoria	5 50
Crescent	20 00	United States	21 00
Diamond Prof	118 50	Utah Mining	43 25
Franklin	19 50	Washington Min	26 00
Gold Dredging	34 50	White Knob	11 50
Humboldt	2 75	Winona	13 00
Isle Royale	45 00	Wolverine	45 50
Melones	4 00	Wyanadote	5 50

COLORADO SPRINGS STOCKS

Acacia	10 1/2	Hayden	10 00
Alamo	80 50	Ingham Con	10 00
Altamont	—	Isabella	10 1/2
American Con	—	Jack Pot	10 00
Anaconda	81	Kimberly	10 00
Aola	10 1/2	Lexington	10 00
Arcadia Cons	10 50	Magick Rock	10 00
Argentum Junta	20	Maine	10 00
Bankers	10 1/2	Montreal	10 00
Banff	—	Montgomery Beauty	10 00
Bob Lee	12 00	Mollie Gibson	10 00
Creede & C. Co.	11 1/2	Moon Anchor	10 00
Cripple Cr'k Con	12 1/2	Mount Rose	10 00
Dante	12 1/2	New Haven	10 00
Dos Moines	10 1/2	Oriole	10 00
Kirkton Con	10 1/2	Orphan	10 00
El Paso	—	Pharmacist	10 00
Emm's Almes	20 1/2	Pilgrim	10 00
Fanny B	14 1/2	Portland	10 00
Favorite	10 1/2	Pr. Albert	10 00
Flower of the West	10 1/2	Rattler	10 00
Golden Fleec	25	Specimen	10 00
Gold & Globe	25	Theresa	10 00
Gold King	10 1/2	Union	10 00
Gould	10 1/2	Vindictive	10 00
Granite Hill	10 1/2	Work	10 00

ROSSLAND, BRITISH COLUMBIA,

Brandt & G'd'F'k	20	Kootenay Gold F.	—
Brit.-Amer. Cor	5 60	Lerville	16
Brit.-Col. Dev. Co	—	Lily May	10
Canada Gold Fields	10	Lon & Van M. D. Co	—
Cariboo	1 25	London R. C. G. F.	50
Commander	—	Monte Cristo	—
Deer Park	16	New G'd'F'k & C. 50	—
Duffer	16	Novelt	—
Evening Star	10	Queen Bess Prop	5 50
Fern	40	Rambler Con	20
Gold Fields of B.C.	—	Red Mount. View	—
Hastie Brown	—	Rego	—
Hilltop	3 75	Roger Bob	—
Horn Excise	07	Silver Queen	16
Iron Horse	—	St. Elmo	05
Iron Mask	67	Slocan Star	1 20
Jesse	10	Vic. Trm. Drv. Co.	—
Jumbo	—	Waverly Mines	—
Kenneth	—	War Eagle Con	3 05
Kerstone	—	White Bear	10

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Alta Con	45	Mexican	47
Andes	14	Occidental	10
Belcher	52	Ophir	100
Boat & Belcher	58	Overman	11
Bullion	65	Ontario	—
Caledonia	55	Plymouth	—
Campbell	30	Potosi	20
Chollar	31	Quicksilver	—
Confidence	75	Quicksilver pref	—
Con. Cal. & Va	1 70	Savage	16
Crown Point	20	Ingot	—
Deadwood	—	Sierra Nevada	68

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THE PORTLAND GOLD MINING CO.,
(Stock Transfer Office, Colorado Springs.)

Mines at Victor, Colorado

COLORADO SPRINGS, Colo., May 19, 1898

The Ingersoll-Sergeant Drill Co.

Gentlemen:—We bought two years ago one of the largest size of the straight line type of Ingersoll-Sergeant Platen Inlet Compressor

This was found to be too small for our needs about a year ago and we purchased of you a Duplex Corliss machine 16x18x14.

This was set in place in our shaft house in the Cripple Creek District, 10,000 feet above the level of the sea, and has been running continuously ever since, and at times over in Kellpe drills. The steam cylinders were connected to an independent Jet Condenser for which we are using the river water, and the resultant economy of operation is very noticeable.

The operation of this Compressor is as near perfect as that of any machine we have ever seen, and this type is well worth the extra cost on account of the great permanent economy in operation.

Our mine is equipped exclusively with your drills and we have only the highest words of praise to give them.

Yours very truly, THE PORTLAND GOLD MINING CO., Jas. A. Burns, President

INCORPORATED MINES PAYING DIVIDENDS.

Names of Mines	Location	No. of Shares	Capital Stock	Par Value	Amount of last Dividend	Date of Last Dividend	Total Amount Paid in Dividends	Kind of Minerals Produced
1 Astna Coop.	California	100,000	\$ 500,000	\$ 5	\$ 10	July 1899	\$ 180,000	Q.
2 Alamo	Utah	125,000	125,000	1	02	April 1899	2,500	G., C., I.
3 Alaska Treadwell	Alaska	200,000	5,000,000	25	37½	Apr 1899	4,070,000	G.
4 Alaska Mexican	Alaska	200,000	1,000,000	5	10	Apr 1899	353,031	G.
5 Anaconda	Montana	1,200,000	30,000,000	25	1 25	May 1899	9,750,000	C.
6 Anchors Leland	Colorado	600,000	600,000	1	03	Apr 1899	198,000	G.
7 American Gold	Colorado	300,000	3,000,000	10	07	Mar 1899	407,000	Q., S., L.
8 American Coal	Maryland	60,000	1,500,000	25	1 25	March 1899	652,000	Coal
9 American Zinc, Lead and Smelting	Missouri	200,000	500,000	25	10	July 1899	20,000	Z., L.
10 Aurora	Michigan	100,000	2,500,000	25	50	June 1899	890,000	I.
11 Argonaut	California	200,000	2,000,000	10	10	June 1899	300,000	
12 Bald Butte	Montana	250,000	250,000	1	06	May 1899	702,148	G., C., S.
13 Bonanza Development	New Mexico	300,000	3,000,000	10	3 50	June 1899	1,500,000	
14 Boston & California	California	600,000	600,000	1	06	March 1899	36,000	
15 Boston and Colorado Smelting	Colorado	15,000	750,000	50	5 00	April 1899	375,000	
16 Boston & Montana	Montana	150,000	3,750,000	25	8 00	May 1899	10,775,000	G., C., S.
17 Breeze	Colorado	200,000	5,000,000	25	05	June 1899	50,000	I.
18 Bullion Beck and Champion	Utah	100,000	1,000,000	10	10	June 1899	2,378,400	G., S.
19 Bunker Hill and Sullivan	Idaho	300,000	3,000,000	10	07	May 1899	705,000	S. L.
20 Cariboo	British Col.	20,000	800,000	1	01 ½	Feb 1899	248,985	G.
21 Calumet & Hecla	Michigan	10,000	2,500,000	25	20 00	June 1899	62,850,000	C.
22 Centennial Eureka	Utah	30,000	1,500,000	50	50	June 1899	2,120,000	S. L.
23 Central Lead	Missouri	10,000	1,000,000	100	50	June 1899	112,000	L.
24 Charleston	S. Carolina	10,000	1,000,000	100	2 00	June 1899	200,000	
25 Colorado Smelting	Montana	100,000	1,000,000	10	1 00	Jan 1899	1,945,000	G., S., C.
26 Consolidated Tiger and Poorman	Idaho	1,000,000	1,000,000	1	02	Dec 1898	20,000	G., S.
27 Creston Leasing	Colorado	1,000,000	1,000,000	1	01	Dec 1898	54,00	
28 Crowned King	Arizona	800,000	8,000,000	10	02	Dec 1898	232,000	G., S., L.
29 De Lamar	Idaho	4,000	2,000,000	5	12	May 1899	2,846,000	G., S.
30 Deer Trail No 2	Washington	1,000,000	1,000,000	1	00 25	June 1899	32,500	
31 Doe Run	Missouri	5,000	500,000	100	50	June 1899	75,000	L.
32 Empir. State	Idaho	75,000	750,000	10	20	July 1899	185,638	
33 Fanny Rawlings	Colorado	1,000,000	1,000,000	1	01	May 1899	10,000	G., S.
34 Ferris-Haggerty	Wyoming	1,000,000	1,000,000	1	00 ½	Mar 1899	5,000	O., G., S.
35 Garfield Consolidated	Colorado	1,200,000	1,200,000	1	01	July 1899	34,000	G.
36 Golden Star	Ontario, Canada	100,000	100,000	1	01	July 1899	41,000	
37 Gold Coin of Victor	Colorado	1,000,000	1,000,000	1	01	June 1899	210,000	G.
38 Gold King	Colorado	1,000,000	1,000,000	1	02	May 1899	30,000	G.
39 Golden Cycle	Colorado	200,000	1,000,000	5	05	June 1899	198,500	
40 Grand Central	Utah	250,000	250,000	1	15	June 1899	531,250	G., S., C., L.
41 Gwin	California	20,000	1,000,000	50	25	June 1899	71,500	G.
42 Grass Valley Exploration	California	50,000	100,000	2	25	July 1899	12,500	
43 Helena and Friesco	Idaho	500,000	2,500,000	5	25	June 1899	550,000	S. L.
44 Highland	S. Dakota	100,000	10,000,000	100	20	July 1899	3,924,718	G.
45 Holy Terror	S. Dakota	300,000	300,000	1	01	Mar 1899	122,000	G.
46 Homestake	S. Dakota	125,000	12,500,000	100	50	June 1899	7,556,250	G.
47 Horn Silver	Utah	400,000	10,000,000	25	05	July 1899	5,270,000	S. L.
48 Idaho	British Col.	500,000	500,000	1	05 ½	Jan 1899	292,000	
49 Isabella	Colorado	2,250,000	2,250,000	1	02	June 1899	448,500	G.
50 Jack Pot	Colorado	1,000,000	1,000,000	1	02 ½	Mar 1899	25,000	G.
51 Jamison	California	390,000	3,900,000	10	10	April 1899	50,700	
52 Lake Superior Iron	Michigan	84,000	2,100,000	25	1 00	Feb 1899	736,000	L.
53 Lillie	Colorado	1,000,000	1,000,000	1	05	July 1899	28,380	G.
54 Modoc	Colorado	500,000	500,000	1	02	June 1899	140,000	G.
55 Montana Ltd.	Montana	600,000	3,800,000	5	12	Apr 1899	2,997,557	G., S.
56 Montana Ore Purchasing	Montana	40,000	1,000,000	25	1 00	July 1899	1,200,000	
57 Morning Star	California	2,400	240,000	100	2 50	June 1899	732,600	G.
58 Mercury	Utah	200,000	5,000,000	25	12 ½	Jan 1899	1,286,000	G.
59 Mammoth	Utah	400,000	10,000,000	25	20	July 1899	1,430,000	G., S., C., L.
60 Mead	California	2,000,000	2,000,000	1	20	June 1899	120,000	G.
61 Monument	Colorado	300,000	300,000	1	01	Dec 1898	12,624	
62 Moulton	Montana	400,000	2,000,000	5	06	Feb 1899	480,000	
63 Mt. Chasta	California	20,000	100,000	5	30	May 1899	8,000	
64 New York & Hon. Rosario	Central A.	150,000	1,500,000	10	10	June 1899	1,650,000	S. G.
65 Napa Cons.	California	100,000	700,000	7	20	July 1899	1,100,000	Q.
66 New Idria Quicksilver	California	100,000	500,000	5	20	July 1899	140,000	Q.
67 North Star	California	200,000	2,000,000	10	25	Apr 1899	550,000	G.
68 Original Empire	California	50,000	5,000,000	100	1 00	May 1899	2,801,500	C.
69 Oceola	Michigan	50,000	1,250,000	25	3 00	June 1899	2,600,898	C.
70 Parrot	Montana	230,000	2,300,000	10	1 50	May 1899	84,975	
71 Pennsylvania Consolidated	California	51,500	5,150,000	10	20	July 1899	62,500	G.
72 Pioneer	Colorado	100,000	1,000,000	10	12 ½	Mar 1899	2,197,080	G., S.
73 Portland	Colorado	3,000,000	3,000,000	1	02	June 1899	45,000	G.
74 Plumbago	California	300,000	300,000	1	15	Jan 1899	643,867	Q.
75 Quicksilver Pref.	California	43,000	4,300,000	100	50	May 1899	1,845,411	Q.
76 Quicksilver Consolidated	California	57,000	5,700,000	100	40	July 1899	1,635,500	
77 Quincy	Michigan	100,000	2,500,000	25	6 00	August 1899	11,070,000	G.
78 Republic Consolidated	Washington	3,000,000	3,000,000	1	01	June 1899	183,000	G.
79 Kamibler-Cariboo	British Col.	1,000,000	1,000,000	1	01	April 1899	50,000	
80 Royal Consolidated	British Col.	2,500,000	2,500,000	1	01	June 1899	1,050,000	G.
81 Sacramento	Utah	1,000,000	5,000,000	5	00 ½	July 1899	92,500	G.
82 Small Hope Consolidated	Colorado	250,000	5,000,000	20	10	Feb 1899	3,325,000	S.
83 South Swansea	Utah	150,000	150,000	1	05	June 1899	126,560	S. L.
84 Standard	Idaho	500,000	500,000	1	06	Apr 1899	1,745,000	G., N.
85 Standard Consolidated	California	200,000	20,000,000	100	10	May 1899	3,859,228	G., S.
86 St. Joseph	Missouri	30,000	3,000,000	10	50	June 1899	2,859,500	L.
87 Silver King	Utah	160,000	8,000,000	20	25	June 1899	2,125,000	S. L. G.
88 Smuggler	Colorado	1,000,000	1,000,000	1	01	June 1899	1,155,000	S. L. Z.
89 Swansea	Utah	100,000	500,000	5	05	June 1899	166,500	S. L.
90 Tamarack	Michigan	60,000	1,500,000	15	4 00	June 1899	5,910,000	G.
91 Tomboy	Colorado	200,000	2,000,000	10	4 00	May 1899	730,000	G.
92 Utah	Utah	100,000	1,000,000	10	02	Jan 1899	179,000	G.
93 Vindicator Consolidated	Colorado	1,500,000	1,500,000	1	05	July 1899	253,750	G.
94 War Eagle Consolidated	British Col.	2,000,000	1,000,000	1	01 ½	June 1899	335,250	
95 Wolverine	Michigan	60,000	2,500,000	25	1 50	April 1899	160,000	C.
96 Yellow Aster	California	100,000	1,000,000	10	10	May 1899	203,789	G.

S. Silver; G. Gold; L. Lead; C. Copper; Q. Quicksilver; I. Iron; Z. Zinc.
N. B.—Companies not listed paid nothing in the last twelve months. *Paid since consolidation, \$63,000; Republic paid \$120,000 under old management.

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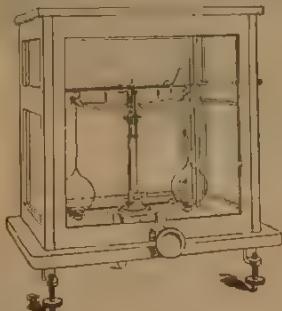
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on the engine makes it run evenly and without any loss from friction or unnecessary wear. It saves more than it costs every few days and prolongs the life of the engine. Catalogue sent on application, and prices quoted if desired.

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Superior to all others for exploding any make of dynamite or blasting powder. Each fuse folded separately and packed in neat paper boxes of 50 each. All tested and warranted single and double strength with any length of wires.

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Pumping Attachment with Pipe for either.....	\$40.
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Also Four, Eight and Twelve-horsepower Whims.	

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Wood Working Machinery



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Box Factories, Planing Mills, Sash, Door & Blind Factories
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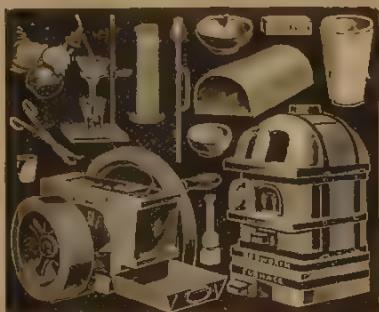
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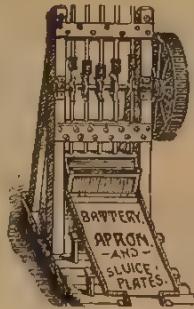
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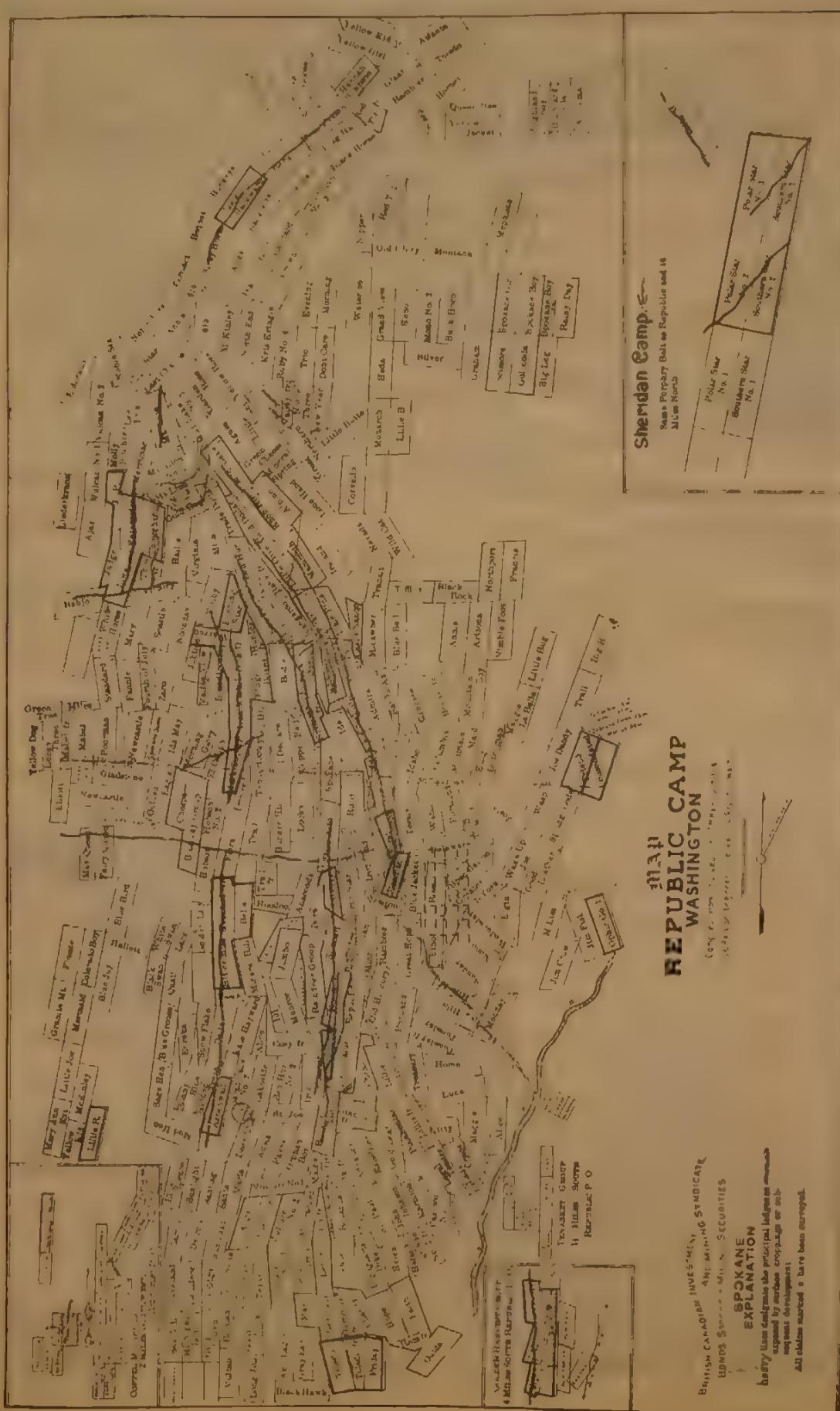
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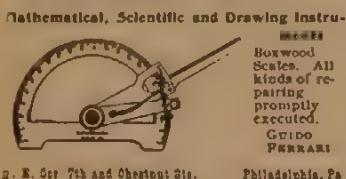
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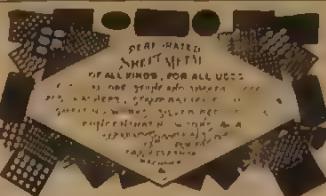


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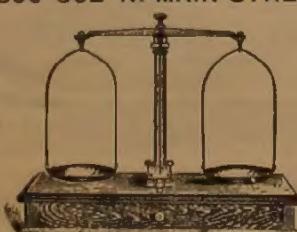
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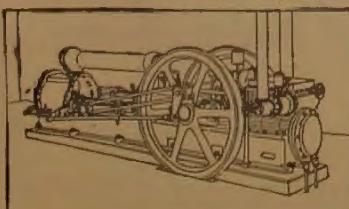
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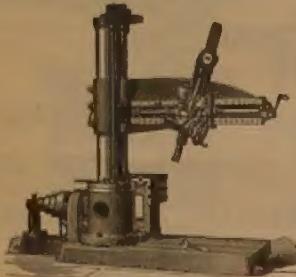
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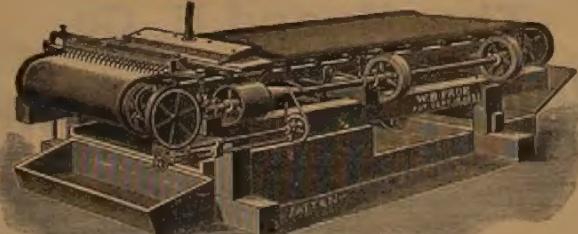
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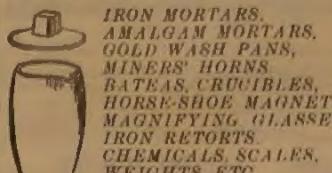
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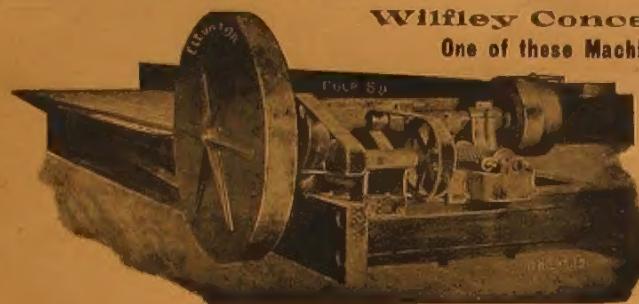
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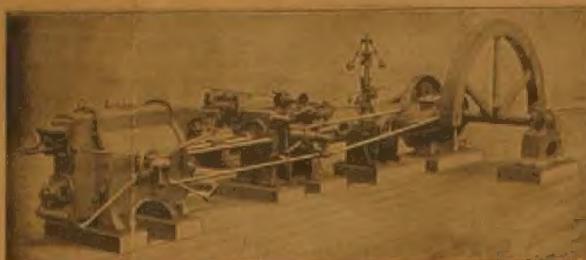
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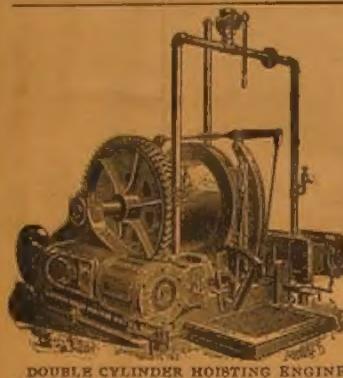
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